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OF THE
AMERICAN
WELDING SOCIETY

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American Welding Society

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JOURNAL

OF THE

AMERICAN WELDING SOCIETY

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AMERICAN WELDING SOCIETY
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JOURNAL

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American Welding Society

Origin and Purpose of the Society

Within the last ten or twelve years welding by the electric arc, oxy-acetylene, thermit and resistance methods has been accepted by industry as one of its most important production and repair processes. Formerly, welding was employed principally to repair broken parts of machinery and other metal parts, but until comparatively recent years the value of welding as a standard method of joining metal pieces in general manufacturing was not fully appreciated. During the World War, however, the various welding processes came into their own rapidly because speed of production in every metal-using and metal-fabricating industry soon became a vital factor.

At first welding was limited to use on small or less important parts, but as favorable experience soon showed the desirability, its field of application was gradually extended to heavier and more important construction and repair work. Many practical demonstrations of the utility of welding focused attention on its marked economic advantages with the result that now all welding processes are widely used in all branches of manufacturing. Welding is employed for an almost limitless number of applications from the manufacture of such small articles as watch-stems to the largest metal-fabricated structures—ships, locomotives, trunk oil and gas pipe lines, gas tanks and the largest turbine electric generators.

Development of welding applications was so rapid that the new art did not always show to the best advantage. The apparent simplicity of gas and electric welding led to its use by untrained workmen and in applications where the design of the joint between the parts to be joined or the nature of the material were not entirely adaptable to welding by the particular method used. Consequently some unsatisfactory work was done which resulted in delaying the day when engineers and the public at large were willing to accept welding with full confidence.

This condition was recognized by a number of far-seeing men interested in the conservative development of welding, and as a result, the American Welding Society was formed in 1919 for the broad purpose of putting the welding art on a sound, scientific and engineering basis. It was appreciated that only with such a foun-

dation could welding ever be recognized as a thoroughly reliable process and be accepted for general employment in industry.

The American Welding Society is an organization of individuals and also companies and corporations interested in welding by any process—either as manufacturers of welding equipment and supplies interested in the commercial acceptance of the art, or as users concerned with its efficient application.

Aims of the Society

The detailed aims of the society for accomplishing the general purposes for which it was formed, include:

1. To collect and make available authentic and up-to-date information on welding, gas and electric arc cutting, and to be recognized as the authoritative source of such information by manufacturers in the welding field, users of the process, engineering societies and legislative bodies.

2. To provide a means for the interchange of knowledge and experience to aid in the solution of the problems of the welding art—technical, ethical and commercial—through cooperative effort.

3. To be the agent of the industry in cooperative research on important technical problems.

4. To serve as a common spokesman of the industry in matters pertaining to its welfare.

5. To provide opportunities for social intercourse, and thus to promote a better understanding among manufacturers, users and scientists in the welding field, and to foster a spirit of cooperation for the common good.

6. To provide a stabilizing influence which will aid in the sound and steady development of this new process.

7. To encourage the development of welding through improvements in present applications and expansion of its uses into new fields.

8. To develop technical and ethical standards for the welding industry.

9. To advance and protect the commercial interests of users of welding and of manufacturers of welding apparatus and supplies.

Principal Departments of the Society

The work of the Society is carried on through a number of channels, the most important of which are local sections, publications, national meetings, research department (American Bureau of Welding) committees, and information service.

Sections of the Society

Sections of the American Welding Society are now organized in a number of large cities (see page 2); others will be formed in the various industrial centers throughout the country to assist in promoting the work of the Society. Regular monthly meetings are

held in each section at which papers and lectures of general interest are presented.

Section meetings provide a very valuable medium for the Society to carry out its functions. It is true that important papers are published in the Journal, nevertheless meetings allow the author to personally present his material, to illustrate important points by lantern slides, diagrams, exhibits, demonstrations and moving pictures. Moreover, they afford an opportunity for discussion. Contentions by authors can many times be expanded and improved as the result of the combined wisdom and experience of other members present.

Aside from the obvious advantages there are reasons which are sometimes overlooked but which are very important. Meetings of this sort provide an opportunity for association with others in the same field and discussion of problems which are of mutual interest. This results often in the obtaining of new ideas and suggestions and creates good fellowship. We must depend upon section meetings for the creation of enthusiasm in the work of the Society and in welding itself. The effect of this enthusiasm in bringing about the extension of the use of welding is not always tangible, but, nevertheless, is productive of valuable results.

Publications

The principal publication of the Society is its monthly Journal which is distributed free to all members. This publication was started in January, 1922. In it are included papers giving accurate information on the application of welding in a wide variety of fields. A large number of research committee reports are also included.

Important papers presented before national and section meetings are published regularly. In addition to these technical papers there are included news items of section activities, actions taken by the Society through its various committees, officers and Board of Directors, statement of financial affairs of the Society, an employment service bulletin, a review of current welding literature, technical question and answer column and an advertising section. Beginning with the year (1924) there was published a membership directory as the August issue of the Journal. This directory includes full information concerning Society activities, the names and addresses of all members, a list of the companies who are supporting the Society through Sustaining members and finally, the advertising section. This directory may really be considered as a "blue book" of those identified with the welding industry. Last year the Directory was expanded to a Year Book and much additional information incorporated.

In order to provide a permanent record, the Society, at the end of each year, binds a limited number of copies of its Journal in attractive book form, which are sold to members at $5 per volume.

The bound volumes contain a subject and author's index. Volumes for the years 1922-3-4-5-6, are still available.

Aside from the Journal, the Society publishes from time to time bulletins containing reports of its research department, the American Bureau of Welding. Not all of the Bureau reports are published in bulletin form, only those for which there are a sufficient demand as separate documents. These are made available to members at practically the cost of printing.

National Meetings

In addition to the local section meetings there are held each year two general meetings of the Society; the fall meeting in October and the annual meeting in April. The fall meeting is generally held at some section headquarters outside of New York, while the annual meeting is always held at the headquarters of the Society.

The fall meeting of 1926 was held in Buffalo. In accordance with the precedent established at a previous meeting, an outstanding feature was the Second Welding Exhibit staged by the society. A large auditorium was given over to exhibits demonstrating the new developments in apparatus and materials that have been made during the past few years enabling prospective users of welding to receive first-hand demonstrations of what could be done in the welding and cutting field by the several processes. In addition, a number of welded products were exhibited, taken from a wide variety of fields.

This year a combined exhibition will be held with the American Society for Steel Treating in Detroit during the week of Sept. 19 to 23. About 30,000 people are expected to view the welding exhibits which will occupy a large room of 10,000 sq. ft. This exhibition with the National Steel and Machine Tool Exposition will be the largest exhibit of its kind ever held. Four technical societies will have meetings in Detroit at the same time. A wide variety of important technical papers have been selected for the occasion.

The annual meetings of the Society, which occur during the last part of April, are devoted to research committee sessions, business sessions, election of officers, annual reports of committee chairmen, annual meeting of the research department (American Bureau of Welding), Board of Directors' meeting and annual dinner. It has been stated by competent experts that the value of one annual meeting alone is worth the membership dues in the Society several times over.

Research Department—Information Service

The research department of the American Welding Society is known as the American Bureau of Welding. It also acts as the Welding Research Department of the National Research Council.

The purpose of the Bureau is to bring to bear on the solution of welding problems the latest scientific knowledge and the scientific

method of attack. To this end, the cooperation of all interested scientific and engineering organizations has been enlisted. It also provides an organization whose reports and pronouncements are accepted the world over as sound and absolutely free from commercial bias.

The work of the Bureau is carried on through research subcommittees which handle specific problems. Members of these committees are interested experts representing both the scientific and practical side and include also business men. In this way there is brought to bear on the solution of complex welding problems the best talent that is available.

In addition to specific research problems the Bureau maintains a technical information service. During the past year several hundred requests for information have been satisfactorily answered. Where the information is of general interest the questions and answers are published in the Journal of the Society. Through the work of its committees and its information service the Bureau has acquired during the past few years a reputation as an authentic source of welding information that is recognized the world over.

Technical societies in the various fields of engineering have come to recognize the value of specifications and standards. These standards and specifications came about as the result of experience which has shown that a particular method or material is best suited for a particular purpose. Without reliable specifications one would have to depend upon one's own experience or upon the experience of the manufacturer. Many times the user would be unfamiliar with the methods and materials that were best suited for his particular case, while, in turn, the manufacturer would be handicapped by a variety of specifications of individual customers. It would be necessary for the manufacturer to have on hand widely different materials for the same purpose. Quality would be sacrificed and in many instances inferior materials and methods would be used and cost would of necessity be increased because of lack of standardization. In our particular case, without the protection of specifications, confidence in welding would be destroyed and its extension retarded. Fortunately for the welding industry, the American Welding Society and its research department (the American Bureau of Welding) have successfully covered this field in a manner which is acceptable and appreciated by the entire industry.

Scratching the surface of scientific investigation has made it possible to overcome apparently insurmountable obstacles which has resulted in the trebling of the use of welding during the past few years. Moreover, with the work now under way and that to be shortly started, as, for example, the investigations in the structural field, there can be no doubt but that the use of welding will be increased many times during the next few years.

The combined cost of the investigations conducted under the auspices of the Bureau will total several hundred thousands of dollars. Results are made available through publication to all

members of the Society. The annual report of the American Bureau of Welding is given elsewhere in this Year Book.

Cooperation with Local Engineering Organizations

Opportunities for a wider field of usefulness on the part of the Sections have developed recently through the formation, in some of the larger centers, of affiliated local organizations. Not only has such local affiliation brought about greater cooperation and unity among engineers—highly desirable objectives—but it has given the welding engineer a higher standing in civic and municipal affairs. It has also saved much duplication of effort and expense and has increased the attendance and interest at meetings.

Headquarters

The Society has its headquarters in the Engineering Societies Building, 25 to 33 West Thirty-Ninth Street, between Fifth and Sixth Avenues, New York, which is easily accessible from all parts of the city, by subway, elevated railway and surface lines. It is

Engineering Societies Building

convenient to most of the principal hotels, theaters and railway stations, and is the New York headquarters for engineers.

The Engineering Societies Building was made possible by the gift of $1,050,000 by Andrew Carnegie to the engineers of America as represented by the American Institute of Electrical Engineers, the American Society of Mechanical Engineers and the

American Institute of Mining Engineers. The societies purchased the land and provided the remainder of the funds. Each of these societies appointed three members upon a board of trustees, and this board was subsequently incorporated as the United Engineering Society for the purpose of administering the building and holding title to the property. In August, 1916, the American Society of Civil Engineers was admitted as an additional founder society and now holds with the other three founder societies an equal interest in ownership, occupancy and administration of the building, realizing more fully the purpose of Mr. Carnegie, that the building should be the home and headquarters of the engineering profession of America.

The American Welding Society has its offices on the sixteenth floor. Adjoining are the offices of the Division of Engineering and Industrial Research of the National Research Council, which organization is closely affiliated with the research work of the Society. Many other engineering and scientific organizations beside the founders have their headquarters in the building.

Engineering Societies Library

The library, which comprises the individual libraries of the American Institute of Electrical Engineers, the American Society of Mechanical Engineers, the American Institute of Mining Engineers, the American Society of Civil Engineers, and the United Engineering Society, is located on the thirteenth and fourteenth floors of the Engineering Societies Building. It is conducted as a free public reference library and contains over 150,000 volumes. In addition to engineering works it contains the general reference books of the allied sciences such as physics, mathematics and chemistry.

The library is open to the public from 9 a. m. to 10 p. m. on all week days except holidays throughout the year, and excepting during July and August, when the hours are 9 a. m. to 6 p. m.

Employment Service

In order to assist its members, the Society maintains an employment service bulletin, which is published regularly in the monthly journal. This service is free to those seeking positions and also to employers seeking welding talent. Members desiring to insert announcements in this bulletin should send same to the Society headquarters to reach the office not later than the 30th of the month for publication in the following issue of the Journal.

Training Courses for Welders

The American Welding Society has been engaged for a number of years in an attempt to promote the art of fusion welding through an adequate supply of competent welders. Several years ago it published in bulletin form an analysis of training courses for oxy-acetylene welders and for electric arc welders. These courses were

prepared by representative committees, the members of which gave freely of their time and effort to the completion of these reports. These reports are known as Bulletin No. 4, Training Course for Oxy-Acetylene Welders, and Bulletin No. 7, Training Course for Electric Arc Welders.

More recently additional committees were created under the leadership of E. H. Ewertz as chairman, for the purpose of preparing manuscripts on the fundamentals of welding and formulating the work of both committees into a manuscript which will serve as an authentic and up-to-date text for the training of welders.

The work of Mr. Ewertz' committees was divided into four parts as follows:

Training Oxy-Acetylene Welders.
Training Electric Arc Welders.
Training Resistance Welders.
Training Thermit Welders.

Each of these reports was prepared by a special committee, the membership of which represented the late and most successful practices in that particular phase of welding.

The training course for thermit welding has already been published. Those for arc, gas and resistance welding will be published shortly. These courses present the best knowledge available, not only from the welding standpoint but also from the standpoint of experience in preparing subject matter for training courses. All welding schools, both public and private, are urged to give it the most careful consideration and to use it as a text and guide in laying out proper courses for the training of welders. The arrangement of the subject matter is flexible and can be easily adapted to programs organized for the purpose of preparing new workers to enter this industry, as well as for the purpose of extending the technical education and skill of those already employed as welders.

Standardization of Goggles

The American Welding Society has made an attempt to ascertain the needs for standardization in the matter of size and quality of glasses to be used in shields, helmets, goggles, etc., for the protection of welding operators. A questionnaire was sent out to representative users and manufacturers and an analysis of the information secured from this questionnaire was published in the July issue of the *Journal*.

Nomenclature, Definitions and Symbols

A committee has been appointed by the society to prepare standard nomenclature, definitions and symbols in the welding field. Considerable progress has been made in this direction by the committee and a progress report is expected very shortly.

Samuel Wylie Miller Medal

Through the generosity of S. W. Miller, a past president of the American Welding Society and Consulting Engineer of the Union Carbide & Carbon Company, there has been established by the society a gold medal to be known as the "Samuel Wylie Miller Medal." This medal is to be awarded annually during the lifetime of Mr. Miller for meritorious achievement in certain branches of the welding art—the award to be made under the conditions prescribed by a board of trustees.

Under the terms of the gift, the medal is to be administered by a self-perpetuating board of trustees consisting of E. H. Ewertz, C. A. McCune and F. M. Farmer, chairman. The sum of $150 is to be paid to the American Welding Society on or before the first day of January of each year for the support of the medal.

The following rules and regulations governing the award of the medal have been drawn up by the Board of Trustees:

1. The name of the medal shall be the "Samuel Wylie Miller Medal."
2. It shall be awarded annually for an outstanding development which has contributed conspicuously to the advancement of the art of gas fusion welding or electric arc fusion welding—such development to be described in a paper written in English which shall be submitted to the Board of Trustees on or before Dec. 31 preceding the year in which the award is to be made.
3. Individuals only, but of any country and of any age, shall be eligible for the award.
4. The Board of Trustees reserves the right to withhold making an award in any calendar year when in its judgment no development has been presented to it which merits the medal.
5. The award shall be announced and the medal together with a suitable certificate shall be presented at the annual meeting of the American Welding Society, at which time the paper on which the award is based shall be read by its author. The paper shall be subsequently published in the *Journal of the American Welding Society*.

Mr. Miller, the donor of the medal, has always been associated with gas arc welding and electric arc welding and it seemed fitting to the Board, therefore, that the award should be limited to these two branches of welding.

Any development in these two fields of welding which has contributed conspicuously to the advancement of the art will be eligible for the prize. Examples of such a development are an invention, development of a design which makes for pronounced progress in the application of welding in the structural steel field or any other metal fabricating field, important research work and application of a standard welding process in a new and unique field.

Classes of Membership

There are several classes of membership in the American Welding Society, as follows:

Sustaining Members, being individuals or individuals delegated by corporations, firms, partnerships, etc., interested in the science

and art of welding, with full rights of membership. Annual dues $100.

Members, being individuals interested in the science and art of welding, with full rights of membership. Engineers or individuals competent by experience or training to plan or direct welding operations are eligible to this class. Annual dues, $20.

Associate Members, with right to vote but not to hold office, except in sections as may be provided for by the By-Laws of the Sections. Supervising welders, inspectors and skilled operators, with three or more years' practical experience in welding are also eligible to this class. Annual dues, $10.

Operating Members, who are welders or cutters by occupation, without the right to vote or hold office except in Sections as may be provided for by the By-Laws of the Sections. Annual dues, $5 in the United States and Canada; $10 elsewhere.

Honorary Members, chosen because of special meritorius achievement in the welding field with no annual dues.

Student Members, who are actually in attendance at any one of the recognized colleges and approved trade schools, without the right to vote or to hold office except in Sections as may be provided for by the By-Laws of the Section. Annual dues, $2.50.

It is partly through the revenue derived from *Sustaining Members* that the Society is able to function. Every company that is financially able to do so as part of its obligation should have at least one $100 member.

Members are really the backbone of the Society. Their dues of $20 are sufficient to pay for their share of the overhead expenses, publication and general activities of the Society. From this class we have our most active members who help administer the affairs of the Society and who contribute largely to the results of its various committees.

Associate Members constitute the balance wheel of practical experience. In this class belong the supervising welders and the skilled operators, who, while not always scientifically trained, nevertheless contribute valuable information from their abundant stock of practical experience. It is with their help that advancement can be made and new ideas put into practical use.

Operating Members are the operators with less than three years of experience. Although their dues, barely cover postage, nevertheless it is important that they be members, thereby making it possible for them to keep abreast of all the new developments and the latest authoritative information in the welding field.

Value of Membership in the American Welding Society

1. Affiliation with the American Welding Society, which is a national organization representing the highest standards and ideals of the welding fraternity, is an evidence of a wholehearted interest in the development of the art and science of welding.

2. Every manufacturer using a welding process to any extent benefits financially through the commercial development of the

process and should therefore be affiliated with a cooperative movement for the advancement of the art.

3. Every manufacturer using a welding process should be a member in order to facilitate, through cooperative effort, improvements in the art and expansion of the field of application which will result in further economic advantages to him at a minimum expenditure of time and money.

4. Every manufacturer who uses a welding process should be a member in order to insure that the best interests of the industry as a whole shall be served by having the user influence predominate in the Society.

5. The work of the various committees is an important and valuable factor in developing, stabilizing and standardizing the entire welding art and should be supported by all interested in welding.

6. Individual membership in the Society increases that individual's knowledge of welding and helps him to improve his application of the process.

7. The opportunities for personal contact with the leaders of the industry and for the interchange of experiences with the active men in the art is of obvious value. The *Journal*, which goes to each member once a month, is an authoritative record of the development and progress in the art. By supporting the Society, each member helps to raise the standard of welding efficiency and to increase the number of efficient welders.

8. Section meetings and publications of the Society offer an opportunity for the broadening of the individual member's knowledge of welding and for discussion of the views of others.

9. Each member helps the Society to counteract adverse legislation and other activities which may not only retard progress in the art but may also affect his own business.

10. Welding is one of the most economic processes yet developed for general industry and therefore a cooperative organization in the welding field deserves the full support of all those deriving its benefits.

How to Become a Member

An application blank for membership in the Society is given elsewhere in this issue in the advertising section. This should be filled in and returned to the Secretary. The application blank is reviewed by the Membership Committee and particular pains is taken by the committee to see that prospective members join under the proper classification. Members are notified of their acceptance and upon payment of dues receive a membership card signed by the Secretary which indicates the class of membership and the expiration date.

Emblem

All members of the Society are privileged to wear the emblem of the Society. Emblems may be purchased from the Secretary's

office in the form of pins at $5.00 for the 14 carat solid gold and 75 cents for the gold-filled pins. The pins are finely finished with a dark blue enameled background, and the letters and border in gold.

Management of Society Affairs

As provided in the By-Laws the management of the affairs of the Society is in the hands of a representative Board of Directors, elected by members of the Society in accordance with the By-Laws. A list of the present Board of Directors is given on the inside of the front cover of this Year Book. Inasmuch as it is not possible to hold frequent meetings of such a large body of men, the ordinary affairs of the Society are administered through the President, Secretary and the Executive Committee. The membership of the present Executive Committee of the Society is given below:

EXECUTIVE COMMITTEE

F. M. Farmer, Chairman, Electrical Testing Laboratories.
J. J. Crowe, Air Reduction Sales Company.
J. H. Deppeler, Metal & Thermit Corporation.
D. H. Deyoe, General Electric Company.
J. H. Edwards, American Bridge Company.
E. H. Ewertz, Bethlehem Shipbuilding Corporation.
C. A. McCune, American Chain Company, Inc.
J. W. Meadowcroft, E. G. Budd Manufacturing Company.
A. G. Oehler, Simmons Boardman Publishing Company.
H. S. Smith, Prest-O-Lite Company.

Meetings and Papers Committee

Article 7, Section 1 (d), of the by-laws of the American Welding Society provides that with the approval of the Board of Directors, the President shall appoint:

"A Meetings and Papers Committee which shall plan and make arrangements for the meetings of the Society. It shall also solicit and pass upon all papers offered for presentation to the Society, and determine which of the papers presented at the Section meetings shall be published in the Proceedings. It shall also have power to edit papers before publication."

MEETINGS AND PAPERS COMMITTEE

P. W. Swain, Chairman, McGraw-Hill Publishing Company.
T. C. Fetherston, Linde Air Products Company.
L. R. Gurley, Railway Mechanical Engineer.
C. J. Holslag, Electric Arc Cutting & Welding Company.
W. R. Hulbert, Metal & Thermit Corporation.
F. E. Rogers, Air Reduction Sales Company.
Wm. Spraragen, Engineering Division, National Research Council.
E. Vom Steeg, General Electric Company.

Rules of Procedure of Meetings and Papers Committee

The Society shall publish and distribute free of charge to its members a monthly publication to be known as the Journal of the American Welding Society. The immediate supervision of the work and the handling of publication details shall rest in the hands of an Editor who shall, however, at all times be responsible to the Meetings and Papers Committee. In case of doubt as to policy in regard to editorials, advertising and technical papers, the Editor

shall call upon the Meetings and Papers Committee except that in case of a disagreement it shall be referred to the Executive Committee of the Society.

The Journal may include editorials, news items, technical reports and papers, employment service bulletin, bibliography of current welding literature, advertising and other items arranged from time to time by the Meetings and Papers Committee.

The Editor of the Journal shall ex-officio be Secretary of the Meetings and Papers Committee.

The Meetings and Papers Committee shall be in charge of the arrangement of the programs for the Annual and Fall meetings of the Society and any other national meetings.

The Meetings and Papers Committee shall assist the local sections in securing suitable programs for their monthly meetings.

The Meetings and Papers Committee may not incur any expense in connection with national meetings or publications unless provided for in the annual budget. The Editor of the Journal shall be required to manage publication costs in such a way that the total for the year shall not vary more than 5 per cent from the allotted budget. Modifications in the budget and other special arrangements may be made upon approval of the Finance and Executive Committees.

All papers presented at section meetings shall be the property of the A. W. S. All sections are requested to send copies of all papers presented at their monthly meetings promptly to the Editor of the Journal. Those papers selected by the Editor (subject to supervision of Meetings and Papers Committee) shall be published in the Journal of the Society. The Editor shall cooperate with trade journals desiring to reprint papers and abstracts of papers. The Meetings and Papers Committee may arrange publication of any paper with trade publications and other journals.

Reports of the American Bureau of Welding, technical and other committees of the Society, selected for publication, shall be published in the Journal. Such reports shall, however, receive the necessary approval of the American Bureau of Welding and the American Welding Society before being released for publication.

Any member of the American Welding Society and others interested in welding shall have the privilege of writing technical papers and submitting them for the consideration of the Meetings and Papers Committee. Papers selected for publication shall be published at the earliest convenient time in the Journal.

Authors submitting papers for publication in the Journal shall not submit them to other publications unless this is clearly indicated in the accompanying letter of transmittal.

The Editor shall advise within 20 days after receipt of papers whether or not they will be published in the Journal. Failure of such notification will allow the author the privilege of submitting the paper to other publications.

Papers dealing with the results of research investigations, details as to technique and kindred papers will be favored both as to time and space.

Papers presented before joint meetings with other Societies shall be treated as special cases and the rights of cooperating organizations shall be fully recognized.

FINANCIAL REPORT—AUDITOR'S STATEMENT

AMERICAN WELDING SOCIETY

STATEMENT OF RECEIPTS AND DISBURSEMENTS FOR THE YEAR ENDED MARCH 31, 1927

Receipts

Dues	$13,358.79	
Journal Advertising	11,299.00	
Journal Subscriptions	671.50	
Journal Bound Volumes	245.00	
Bulletins including P. V.	139.35	
Admin. Exp. A. B. of W.	600.00	
Committee Refunds	158.74	
Society Emblems	13.25	
Welding Encyclopedia	18.72	
Refund on Cuts	92.57	
Annual Dinner	753.00	
Annual Luncheon	106.00	
Miscellaneous	550.31	
Bank Interest	158.37	
Total Receipts		$28,164.60
Bal. brt. Forward, April 1, 1926		7,742.91
		$35,907.51

Disbursements

Salaries (not includ. T. S.)	$6,034.70	
Salaries (T. S.)	249.99	
Journal Printing	5,568.80	
Editorial Services	2,100.00	
Room Rental	1,152.00	
Tel. and Tel.	250.65	
Printing and Stationery	938.20	
Printing Promotion	143.67	
Postage and Petty Cash	690.80	
Equipment	516.02	
Annual and Fall Meetings	657.10	
Annual and Fall Dinners	842.95	
Annual Luncheon	124.20	
New York Section	617.30	
Section Refund	4,071.25	
Admin. Exp. A. B. of W.	1,500.00	
Printing Year Book	350.00	
Printing Index and Binding Journal	148.50	
Printing Training Course	200.00	
Traveling Expenses (Soc.)	160.04	
Traveling Expenses (T. S.)	163.99	
Refunds	170.22	
Welding Encyclopedias	14.00	
Miscellaneous	561.20	
Total Disbursements		$27,225.58
Bal. March 31, 1927		8,681.93
		$35,907.51

BUDGET 1927-28

INCOME

	Estimated Income, 1926–1927	Actual Receipts, 1926–1927	Estimated Income, 1927–1928
Advertising	$9,984.00	$11,299.00	$12,500.00
Journal subscription	500.00	671.50	600.00
Journal bound volumes	250.00	245.00	250.00
Bulletins and pressure vessels	200.00	139.35	200.00
Admin. exp. A. B. of Welding	600.00	600.00	600.00
Annual dinner and luncheon	1,100.00	859.00	1,100.00
Miscellaneous	500.00	833.59	700.00
Bank interest	160.00	158.37	200.00
Membership dues	14,190.00*	13,358.79	16,000.00
	$27,484.00	$28,164.60	$32,150.00

*This figure was based on dues of present members; $1,690 was in delinquent dues, some of which was not collected but was replaced by new members.

EXPENSES

	Original 1926–27 Budget	Revised 1926–27 Budget	Expenditures, 1926–27	Proposed Budget, 1927–28
Salaries*	$6,120.00	$6,034.70	$6,034.70	$5,980.00
Salaries (T. S.)†	.....	1,000.00	249.99	1,000.00
Editorial services	2,100.00	2,100.00	2,100.00	2,100.00
Printing Journal[a]	4,800.00	5,400.00	5,568.80	6,000.00
Printing Year Book	350.00	350.00	350.00	350.00
Indexes and binding Journal	175.00	175.00	148.50	175.00
Office rental	1,152.00	1,152.00	1,152.00	1,152.00
Printing and stationery	1,000.00	1,000.00	938.20	1,000.00
Printing (promotion)	500.00	500.00	143.67	500.00
Tel. and tel.	300.00	300.00	250.65	300.00
Postage and petty cash	600.00	600.00	690.80	800.00
Meetings	750.00	750.00	657.10	750.00
Equipment	500.00	500.00	561.02	300.00
Miscellaneous expenses	400.00	400.00	561.20	300.00
Admin. exp. A. B. of W.	900.00	900.00	1,500.00	1,500.00
New York Section	500.00	500.00	617.30	700.00
Sect. Refund (N. Y. excluded)	4,427.00	4,427.00	4,071.25	4,500.00
Traveling exp. (Society)	500.00	500.00	160.04	500.00
Traveling exp. (T. S.)†	.....	500.00	163.99	500.00
Inter. W. & C. exp.†	.....	200.00	.....	.....
Editorial services of training course‡	.....	400.00	200.00	200.00
Publication training course§	.....	500.00	.....	500.00
1926 Annual dinner	1,300.00	1,300.00	$842.95	1,300.00
1926 Annual Luncheon			$124.20	
Ladies' entertainment A. M.§	.....	200.00	.....	.....
Welding encyclopedias	.....	.....	14.00	.....
Refunds	.....	.....	170.22	.....
General office expense	.....	.....	.....	900.00
Contingent	.....	.....	.....	643.00
	$26,374.00	$29,688.70	$27,225.58	$32,150.00

*Revised in October, 1926.

†Authorized by vote of Board of Directors at meeting November 19, 1926.

‡Authorized by vote of Executive Committee at meeting December 21, 1926.

§Authorized by vote of Executive Committee at meeting March 21, 1927.

[a] Increased by vote of Executive Committee at meeting May 28, 1926, from $400 per month to $425 and at meeting February 1, 1927, from $425 to $450.

American Welding Society,
29 West Thirty-ninth Street, New York City.

April 6, 1927.

Dear Sirs:

We have examined the Cash for the twelve months ended March 31, 1927.

Attached hereto is a Statement of Receipts and Disbursements for the year ended March 31, 1927.

We find that these records are verified by the reports of the Bankers Trust Co. and the cheques for disbursements are as indicated on the Cash records.

Yours very truly,
(Signed) WM. J. STRUSS & Co.,
Certified Public Accountants.

Constitution of the American Welding Society

ARTICLE I

Name

This Society shall be known and designated as the AMERICAN WELDING SOCIETY.

ARTICLE II

Objects

The objects of the Society are:

A—To advance the science and art of welding.

B—To afford its members opportunities for the interchange of ideas with respect to the science and art of welding, and for the publication of information thereon.

C—To conduct research into the science and art of welding, co-operating with other Societies, Associations and Governmental Departments for the benefit of the industry in general.

D—To acquire and dispose of property for the purposes aforesaid.

E—To do all other things incidental or conducive to the attainment of the above named objects, or of any of them.

ARTICLE III

Membership

Individuals, scientific societies, associations or governmental departments interested in welding are eligible for membership in this Society.

ARTICLE IV

Government

The management of the affairs of the Society shall be in the hands of a Board of Directors. The Society for the conduct of its affairs may adopt by-laws, rules and regulations not inconsistent with this Constitution, and may provide methods for amending or repealing such by-laws, rules and regulations different from the method of amending this Constitution.

ARTICLE V

Cooperative Research and Standardization

In order to further its objects most effectively, the Society shall provide for the formation of a separate body to be known by some

appropriate title, such as the American Bureau of Welding, or the American Welding Committee, for the purpose of joining with other Societies, Associations and Governmental Departments in cooperative research and standardization in welding.

ARTICLE VI

Amendments

This constitution may be amended by a two-thirds vote of the members voting, expressed orally or in writing, at any annual meeting of the Society as set forth in the by-laws, provided a notice stating the proposed amendment or amendments with the reasons therefor and any known objections shall have been sent to each member at least two weeks prior to said annual meeting.

By-Laws of the American Welding Society

Adopted March 27, 1919. Amended April 28, 1921, April 14, 1922, January 23, 1924, December 23, 1925, July 20, 1927.

ARTICLE I

Membership

Section 1. Individuals having received the approval of a majority of the Membership Committee shall become members of this Society upon the payment of dues, except in the case of honorary members, who shall be elected by unanimous vote of the full Board of Directors.

Section 2. Membership shall be divided into seven classes:

Sustaining Members, being individuals delegated by corporations, firms, partnerships, etc., interested in the science and art of welding, with full rights of membership.

Annual Dues $100.00

Members, being individuals interested in the science and art of welding, with full rights of membership. Engineers or individuals competent by experience or training to plan or direct welding operations are eligible to this class.

Annual Dues $20.00

Associate Members, with right to vote but not to hold office, except in sections as may be provided for by the By-Laws of the Sections. Supervising welders, inspectors and skilled operators with three or more years' practical experience in welding are also eligible to this class.

Annual Dues $10.00

Operating Members, residing in the United States, Canada and Mexico who are welders or cutters by occupation without the right to vote or to hold office excepting in sections as may be provided for by the By-Laws of the Section.

Annual Dues $5.00

Operating Members, residing outside of the United States,

Canada and Mexico who are welders or cutters by occupation without the right to vote or to hold office.

Annual Dues $10.00

Honorary Members, with full rights of membership. Honorary Members shall be persons of acknowledged eminence in the welding profession, or who may be accredited with exceptional accomplishments in the development of the welding art upon whom the American Welding Society may see fit to confer an honorary distinction.

Student Members, who are actually in attendance at any one of the recognized colleges and approved trade schools, without the right to vote or to hold office except in sections as may be provided for by the By-Laws of the Section.

Annual Dues $2.50

Section 3—Rejection by the Membership Committee of any applicant for membership in the Society shall be subject to review and reversal by the Board of Directors by a two-thirds vote of those present and voting.

ARTICLE II

Dues

Section 1. The Annual Dues shall be as follows:

Sustaining Members	$100.00
Members	20.00
Associate Members	10.00
Operating Members (resident)	5.00
Operating Members (foreign)	10.00
Honorary Members there shall be no annual dues	
Student Members	2.50

Section 2. All dues shall be payable in advance and shall cover the period of one year from the last day of the month in which a member joins.

Section 3. Funds in excess of those provided by the annual dues which may be needed for research and other work, shall be secured by voluntary subscriptions to be solicited from its members, or from others specially interested.

ARTICLE III

Organization

Section 1. The American Welding Society, in pursuance of the objects set forth in its Constitution, provides for the formation of Sections.

Section 2. Not less than twenty-five individuals eligible to membership (any class) in the Society may apply for authorization for the organization of a section.

Section 3. The American Welding Society will return to each section fifty per cent of all membership fees received from mem-

bers enrolled in any section except in the case of student members, where the entire fee is to be retained by the Society.

Section 4. The By-Laws of the Section shall not conflict with any provision of the Constitution or By-Laws of the American Welding Society.

ARTICLE IV

Officers, Nominations and Elections

Section 1. The officers of the Society shall be a President, six Vice-Presidents, a Secretary, a Treasurer, and a number of Directors as hereinafter provided. All officers and directors must be members of the Society.

Section 2. The President shall be elected by the Society for a term of one year and may be re-elected at any time for a second term of one year, but in no case shall any individual serve in this capacity for more than two consecutive years.

Section 3. A Senior Vice-President residing in the vicinity of headquarters shall be elected by the Society for a term of one year and may be re-elected at any time for a second term of one year, but in no case shall any individual serve in this capacity for more than two consecutive years. The United States shall be divided into five geographical diisions and one Divisional Vice-President shall be elected from each such division for a term of two years. These geographical divisions shall be known as New York and New England Division, Middle Eastern Division, Middle Western Division, Southern Division and Pacific Coast Division.

The Divisional Vice-Presidents shall not be eligible for immediate re-election to the same office.

Section 4. The Secretary and Treasurer shall be appointed to office by the Directors for such terms of office as the Directors may determine.

Section 5. The Board of Directors shall consist of:

One representative from each section, a number elected by the membership at large, the officers of the Society and three past presidents, all as provided hereinafter.

Each Section at its annual meeting shall elect for the term of one year one director of the American Welding Society who may be the Section Chairman.

At each annual meeting the Society shall elect four Directors at large to serve for a term of three years.

The three junior past presidents shall be automatically members of the Board of Directors.

Section 6. Nominations and elections of the officers shall proceed as follows:

The Secretary shall mail on or before the first Tuesday in February of each year to each member entitled to vote, a notice that Nominations for Officers must reach the Secretary not later than the first day of March. This notice shall outline the vacancies of elective offices that shall be filled at the next regular election and

request nominations for such officers. This notice shall contain a copy of this Section and the list of nominees recommended by the Nominating Committee and information that no name shall appear on the final voting ballot unless proposed by at least 25 qualified members. The notice shall also contain the names of the members of the Nominating Committee.

The Secretary shall mail on or before the first Tuesday in March of each year to each member entitled to vote a ballot stating the names of the candidates for the several offices falling vacant, the time of the closure of the voting. The voter shall prepare his ballot by indicating by means of a cross opposite the name of each candidate he wishes to vote for. The voter shall enclose said ballot in an envelope and seal same. He shall then enclose the sealed envelope in a second envelope marked "Ballot for Officers," seal same and write his name thereon in ink, for identification. The ballot thus prepared and enclosed shall be mailed or delivered unopened to the Tellers of Election.

The Secretary shall certify to the competence and signature of all voters. A ballot without the autographic endorsement of the voter written on the outside envelope is defective and shall be rejected by the Tellers of Election. A ballot which has choice indicated for more names than there are offices to be filled is defective and shall be rejected by the Tellers.

Section 7. The voting for the election of officers shall close at 1 o'clock in the afternoon on the first Thursday in April of each year. The Tellers shall not receive any ballot after the stated time for the closure of voting. The Tellers of Election shall first open and destroy the outer envelopes and shall then open the inner ones, canvass the ballots and certify the results to the Presiding Officer at the first session of the current meeting of the Society. The Presiding Officer shall then announce the candidates having the greatest number of votes for their respective offices and declare them elected for the ensuing year.

Section 8. The names of the candidates proposed by the Nominating Committee and the respective offices for which they are candidates and names of candidates nominated by letter ballot as provided in Section 6 above, shall be printed in separate lists on the same ballot sheet.

Section 9. In case of a tie in the vote for any office, the President, or in his absence, the Presiding Officer, shall cast the deciding vote.

Section 10. The term of all elective officers shall begin on the adjournment of the annual meeting of the Society. Officers shall continue in their respective offices until their successors have been elected and have accepted their offices.

Section 11. Tellers of Election. The President shall, on or before the first Thursday in April of each year, appoint three Tellers of Election of Officers, whose duty shall be to canvass the votes

cast, and certify the same to the President, or Presiding Officer, at the first session of the Annual Meeting. Their term of office shall expire when their report of the canvass has been presented and accepted.

ARTICLE V

Duties of Officers

Section 1. In addition to the duties hereinafter set forth, the officers shall perform such other duties as the Society or Board of Directors shall designate.

Section 2. The President shall preside at all meetings of the Society and of the Board of Directors; he shall have general active management and supervision of the affairs of the Society; shall see that all orders and resolutions of the Board are carried into effect; shall attend generally to its executive business and the supervision and direction of all the other officers in the proper performance of their respective duties; shall submit a report of the operations of the Society for the fiscal year to the Directors at their last regular meeting preceding the annual meeting, and to the members at the annual meeting in April and from time to time shall report to the Board all matters within his knowledge which the interests of the Society may require to be brought to their notice; shall be ex-officio a member of all standing committees; and shall have the general powers and management usually vested in the office of the President of the Society.

Section 3. The Senior Vice-President shall be vested with all the powers, and required to perform all the duties of the President in his absence.

Section 4. The five Vice-Presidents shall be the official representatives of the Society in the Divisions so elected. They are responsible for the general promotion of the Society in their Divisions, that is, for the activities of the present sections and the organization of new sections.

They are expected to attend as many meetings of sections in their Divisions as they can conveniently.

Section 5. The Secretary shall be the executive officer of the Society under the direction of the President and Board of Directors. The Secretary shall attend all meetings of the Society and Board of Directors and record the proceedings thereof. The Secretary shall collect all moneys due the Society and deposit the same in depositories designated by the Board of Directors, reporting such deposit to the Treasurer. The Secretary shall conduct the correspondence of the Society and shall keep full records thereof. Under the President and Board of Directors, the Secretary shall be in responsible charge of all property of the Society. With the approval of the Board of Directors the Secretary shall engage such employees as may be necessary and shall be responsible for the work of all employees of the Society. The Secretary shall perform such other duties as may be assigned to him. The

Secretary shall devote his entire time to the affairs of the Society, unless otherwise authorized by the Board of Directors. The Secretary shall be required to furnish bond for the faithful performance of his duties in an amount to be decided by the Board of Directors.

Section 6. The Treasurer shall keep full and accurate accounts of receipts and disbursements in books belonging to the Society, and shall deposit all moneys and valuable effects in the name, and to the credit of the Society, in such depositories as may be designated by the Board of Directors. All checks shall be signed by the Treasurer. He shall disburse the funds of the Society as may be ordered by the Board, taking the proper vouchers to such disbursements, and shall render to the President and Directors at the meeting of the Board, or whenever they may require it, an account of all its transactions as Treasurer, and of the financial condition of the Society, and at the last regular meeting of the Board preceding the annual meeting of the Society, a like report for the preceding year. He shall give the Society a bond in a sum and with one or more securities as required by and satisfactory to the Board for the faithful performance of the duties of his office, and the restoration to the Society in the case of his death, resignation or removal from office of all books, papers, vouchers, money or other property of whatever kind in his possession belonging to the Society.

ARTICLE VI

Board of Directors

Section 1. The Board of Directors shall have the power:

(a) To manage the affairs of the Society, except as otherwise provided by law, or by these By-Laws.

(b) To purchase or otherwise acquire for the Society any property, rights and privileges which the Society is authorized to acquire, at such prices and on such terms and conditions and for such considerations as they think fit.

(c) To appoint executive officers and fix their salaries.

(d) To determine who shall be authorized to sign, on behalf of the Society, notes, receipts, acceptances, endorsements, checks, releases, any and all contracts and other documents, and shall make such authorization.

(e) To perform such other acts as may be necessary to carry out the purpose of the Society.

Section 2. In each case of vacancy occurring in the Board of Directors through death, resignation, disqualification, or other cause, the remaining Directors, by letter ballot, may elect, or appoint a successor to hold office for the unexpired portion of the term of the retiring Director; and in the event that a quorum of the Board of Directors does not exist, the affirmative vote of a majority of the remaining Directors shall become effective. How-

ever, if the retiring Director has been elected by a Section, such Section shall furnish a successor.

ARTICLE VII

Committees

Section 1. With the approval of the Board of Directors, the President shall appoint the following committees:

(a) An Executive Committee, which shall have such duties as may be prescribed by the Directors to facilitate their work, and such power of the Directors as they may delegate to it from time to time.

(b) A Finance Committee, which shall pass upon all expenditures, prepare the annual budget, and have general charge of the Finances of the Society. The Treasurer shall be Chairman of the Finance Committee.

(c) A Membership Committee of five whose duties shall be to pass upon applications for membership in this Society and such other duties as may be referred to it from time to time.

(d) A Meetings and Papers Committee, which shall plan and make arrangements for the meetings of the Society. It shall also solicit and pass upon all papers offered for presentation to the Society, and determine which of the papers presented at the Section meetings shall be published in the proceedings. It shall also have power to edit papers before publication.

(e) A Nominating Committee of five members shall be appointed by the President on or before the 15th of December of each year. This Committee shall consist of a Chairman who shall be a past President of the Society and four members, not members of the Board of Directors. The Committee shall deliver to the Secretary in writing on or before the last Tuesday in January, the names of its nominees for the various elective offices next falling vacant with a written consent of each nominee.

(f) With the approval of the Board of Directors the President may appoint additional committees for a definite stated purpose.

(g) A Revision of By-Laws Committee, comprising a Chairman (member of Board of Directors) appointed by the President, and a member from each section of the Society, appointed by the Section Chairman.

ARTICLE VIII

Meetings and Notices

Section 1. There shall be two stated meetings of the Society each year, the annual meeting for the election of officers and other business, in New York City, beginning the fourth Thursday in April and the autumn meeting in October at such time and place outside of New York City as may be decided by the Board of

Directors. Other meetings may be called at the discretion of the Directors.

Section 2. Notices of all meetings of the Society shall be mailed to the members at least 30 days prior to the date of such meeting, and to the Board of Directors at least two weeks prior to the date of their meeting, and shall contain the time and place of the meeting and the principal business to come before it.

Section 3. Twenty members entitled to vote shall constitute a quorum at meetings of the Society and ten Directors shall constitute a quorum at meetings of the Board of Directors.

ARTICLE IX

Voting and Proxies

Section 1. Voting by proxy shall not be allowed at any meeting of the Society or its Board of Directors or of any of its Committees except by a personal representative presenting written credentials at the particular meeting stated.

ARTICLE X

Cooperative Research and Standardization, American Bureau of Welding

Section 1. The American Welding Society shall provide the means for cooperative research and standardization in welding by creating a research bureau, which shall consist of at least twelve members appointed by the Board of Directors of the American Welding Society, the Chairman of the Research Committee of each Section of the American Welding Society, and of one representative of each of the other interested societies, associations, and governmental departments as indicated in Section 2. Machinery is thus provided to co-ordinate and control all research and standardization in welding in the American Welding Society and its Sections.

It is the intention of this Society to make this Bureau the coordinating agency for welding research throughout the country and to this end the Bureau has been accepted by the Engineering Division of the National Research Council as its advisory Committee on Welding.

Section 2. Originally the following bodies shall be invited to designate representatives:

American Bureau of Shipping.
American Electro Chemical Society.
American Engineering Standards Committee.
American Institute of Electrical Engineers.
American Institute Mining and Metallurgical Engineers.
American Physical Society.

American Railroad Association.
American Society of Civil Engineers.
American Society of Mechanical Engineers.
American Society of Refrigerating Engineers.
American Society for Testing Materials.
Bureau of Veritas.
Engineering Foundation.
Lloyd's Register of Shipping.
National Fire Protection Association.
New York Academy of Sciences.
Society of Automotive Engineers.
Bureau of Standards, U. S. Dept. of Commerce.
U. S. Navy Dept. Bureau of Construction and Repairs.
U. S. Navy Dept. Bureau of Ordnance.
Federal Board of Vocational Education.

Section 3. The American Bureau of Welding so constituted shall govern itself under its own rules and by-laws, and shall have its own executive head and officers, and at its discretion may extend its membership to other societies, associations and Governmental Departments and increase its representation from the American Welding Society.

ARTICLE XI

Permanent Office

Section 1. A permanent office of the Society shall be maintained in the City of New York and shall be located in the Engineering Societies' Building at 33 West 39th Street or at such other place as the Directors may determine.

ARTICLE XII

Parliamentary Rules

Section 1. Roberts' Rules of Order shall be the governing parliamentary law of the Society in all cases not definitely provided for by its constitution or its by-laws or its own rules.

ARTICLE XIII

Amendments

Changes in these By-Laws may be made by petition signed by ten or twelve voting members of the Society and approved by not less than two-thirds of the Directors present at a meeting regularly called for consideration of the same. Such changes shall be considered temporary and at the expiration of 60 days after proper letter ballot has been sent to the members of the Society shall be considered permanent, unless rejected by 20 per cent of the voting membership.

Rulings Adopted by Board of Directors

April 1920

Powers of Executive Committee—The Board of Directors delegated to Executive Committee its full power with understanding that Executive Committee will immediately report by letter to every member of the Board any action which it has taken and allow sufficient time for objection to such action before it is put into effect. Should a majority of the Board express objection within a week to any action, the President will then immediately call a special meeting of the Board and have the matter presented to them for confirmation.

Section Organization—The Officers of the Society are authorized to assist in formation of sections in any part of the United States under the adopted standard form of Constitution with variations to meet local conditions and to grant the necessary authority for the formation of such sections. When possible, the sections should be affiliated with the local general engineering society and where practicable, the organization work should be conducted from such society headquarters.

January, 1922

Delinquents—A delinquent member shall be carried on the rolls of the Society for a period of one year, for the first three months of which he shall be supplied with the proceedings and other literature, but that following the three months, he shall receive only notices of meetings.

Billing Membership Dues—Each member shall be sent a bill on the first day of the month in which his dues become due; a second bill shall be sent one month later with the words "Second Bill" stamped on it, and a third bill shall be sent two months later stamped with the words "Final Notice, You Will Not Receive Publication If Your Dues Are Not Paid."

October, 1922

Refund to New Sections—No money shall be turned over to a newly organized section on dues received previous to the establishment of the section from members located in that particular section.

February, 1923

Financial Arrangement Between New York Section and National Headquarters—Inasmuch as National Headquarters cannot at this time make the same return to the New York Section as is being made to the other Sections of the Society, National Headquarters will pay for expenses of meeting rooms, stationery, notices and other necessary expenses of the Section, and the regular staff of the Society working in conjunction with the Secretary of the

Section, will send out notices of meetings, circulars, keep proper records and attend to other routine details.

Plans for establishing Sections of the American Welding Society which received approval at the annual meeting of the Society in April, 1923, are available at National Headquarters. These embrace all steps to be followed under the headings given below:

1. Extracts from Constitution and By-Laws of Society relating to Section Organization.

2. Preliminary Meeting—Notice; order of business; application to National Organization for authority to operate as section; suggestions to nomination committee.

3. Organization Meeting—Notice; order of business.

4. Method of Conducting Section Work—Affiliation with some engineering body so as to provide meeting place for monthly meetings and in that way give the section a better technical standing; standard method for handling applications, financial records and reports.

Annual Report—American Bureau of Welding

Developments of the Bureau

One of the most interesting developments in the work of the American Bureau of Welding during the past year has been in the enlargement of its scope of activities. About eight years ago when the Bureau was first organized it had relatively little standing among engineering and scientific organizations. In fact, the whole welding industry was still very much in its infancy.

In order to make sure its pronouncement would be free from commercial bias, the Bureau was officially made part of the Division of Engineering of the National Research Council. In addition there were appointed on the Bureau, representatives from other engineering and scientific organizations.

It must be remembered that there was very little standardization of scientific and technical knowledge in regard to welding and its proper application. It was quite natural, therefore, that the Bureau should appoint a relatively large number of research subcommittees to deal with the several welding processes and with a few specific applications. Among other committees there were appointed Electric Arc, Gas, Resistance and Thermit Welding Research Subcommittees. These committees confined their attention to the preparation of critical digests of existing information in their representative fields and to laying out programs of investigations to secure needed information. As a result of the work of the above committees and the other research subcommittees of the American Bureau of Welding there came about a gradual standardization in the proper way of doing things. A number of very valuable reports were published.

It was quite natural that with the successful accomplishment of these relatively minor tasks the American Bureau of Welding should become better known and should be looked upon as the officially organized representative of the welding fraternity in the matter of research. It was also natural that larger and more important problems should be brought to it for solution.

Up to a year ago the two largest investigations undertaken by the American Bureau of Welding was the matter of Welded Rail Joints and Welded Pressure Vessels, described in greater detail elsewhere in this report.

Suggested Changes

With the gradual development of the American Bureau of Welding and with the successful accomplishments of their tasks, as noted above, the officers and executive committee of the Bureau believed that certain of its committees have now outlived their usefulness and should accordingly be discharged. The Electric Arc, Gas and Thermit Welding Committee have been in existence since the origin of the Bureau. They have many valuable reports to their credit.

The present problems confronting the Bureau demand a different type of organization, for example, the securing of fundamental data relating to the welding of structural steel could not be successfully accomplished by the Electric Arc and Gas Welding Committees, but need a specially appointed committee with specialized experts who will confine their entire attention to the specific problem in question. The officers of the Bureau respectfully suggest that the recommendation of the Executive Committee of the Bureau that these three committees be discharged, be acted upon favorably by the Bureau. This will leave the following research committees: Welding Wire Specifications, Welded Rail Joints, Pressure Vessels and Structural Steel. Incidentally, it might be pointed out that the work of these committees if properly done is sufficient to keep the small staff of the Bureau and Society quite busy.

RESEARCH PROBLEMS

Committee on Welded Rail Joints

During the past year the efforts of this committee have been confined very largely to investigations seeking to improve the seam welded type of joint and measurements of stresses in various parts of rail joints under varying degrees of service conditions and also under tests conditions. Two Progress Reports were published during the year. Progress Report No. 4 appeared in the July, 1926, issue of the *Journal* and consists of 35 printed pages. It includes a description of the method of operation of the repeated impact testing machine and a chart showing the location of failure and the number of blows necessary to cause a failure and photographs of the broken joints. The Fifth Progress Report, consist-

ing of 62 pages, appeared in the March, 1927, issue of the *Journal*. This report includes a series of shear test results made by the committee to develop a joint plate and method of welding, which would give a maximum area of cross section of soundly fused weld metal in the seams. The report also includes a description of some preliminary telemeter tests made to determine stresses in rail joints under conditions simulating various degrees of poor joints and also test joints subjected to blows from the repeated impact testing machine.

Both of these reports have been printed in separate bulletin form by the American Electric Railway Association and distributed to all the important street railways of the country.

Welding Wire Specifications

A number of good and bad welding wire samples were collected from various parts of the country and through the courtesy of the American Chain Company was subjected to careful metallurgical examinations and other tests in order to discover, if possible, the reason why some welding wire is classed as "bad." A report has been compiled and published.

Electric Arc Welding Committee

During the past year an attempt was made to analyze the results of tests of the Emergency Fleet samples dealing with fundamentals of electric arc welding. A number of assignments were made to individual members of the committee and it is expected that a final report will be published within the next six months.

Gas Welding Committee

This committee in itself has been more or less inactive, but has initiated a study of welds subjected to high temperatures. This work is being done under the auspices of the San Francisco Section and includes not only a study of gas welds but also welds made by the electric arc process. A Progress Report has been submitted by the San Francisco Section and, no doubt, a final report will be available for publication within the coming year.

Pressure Vessels

This is one of the new investigations that have been approved for study at the last annual meeting of the American Bureau of Welding. A joint research committee has been organized under the auspices of the American Society of Mechanical Engineers and American Bureau of Welding. This committee includes representatives from both organizations, as well as other interested scientific and engineering societies, representatives of interested welding apparatus manufacturing companies and also from tank manufacturers.

The committee is endeavoring to keep in close touch with everyone interested in this problem in order to assure a program of investigations that will supply needed information in this field. A

subcommittee on "Tests" has laid out a tentative program of investigations, including the types of tanks needed and also tests specimens. Another subcommittee on "Welding Procedure" will specify in detail the exact welding technique to be followed in making up these tanks and specimens. It is estimated that some $25,000 will be needed for this work during the next two years.

One of the most expensive parts of the program is the alternating pressure test on the tanks and the fatigue tests on welded specimens.

Welding of Structural Steel

A thoroughly representative high line committee has been appointed by the American Bureau of Welding to deal with this subject under the chairmanship of J. H. Edwards, Assistant Chief Engineer of the American Bridge Company. A subcommittee on "Literature" has made a critical digest of existing tests data in this field which will probably be published during the coming year. A subcommittee on "Tests" has laid out a program of investigations to secure fundamental design data as to unit strength of welds subjected to different processes for various thicknesses of metal and types of joints. A subcommittee on "Welding Procedure" has prepared tentative specifications covering the inspection and welding technique to be followed in making up each of these specimens. It is planned to have some fifteen leading structural fabricating shops located in different parts of the country, make up tests specimens which will be tested at governmental, university and company laboratories. In order to bring this to the attention of the steel industry a paper was prepared by the Director of the Bureau and presented at the annual meeting of the American Iron and Steel Institute. A critical digest of existing information on the subject of welding of steel structures was prepared by the secretary and presented before the annual meeting of the American Institute of Steel Construction. Other lectures have been given on this subject by the chairman and individual members of the committee.

The cost of this investigation will be about $25,000 and will be borne jointly by the structural steel industry and by the welding industry. The American Institute of Steel Construction, as the organized representative of the structural steel industry, has already pledged $5,000 a year for two years for this work. Efforts are being made to raise the allotted sum from the welding industry.

Research Information Service

The American Bureau of Welding continues to act as a clearing house for research information and for supplying technical information to those making specific requests. It is expected that inquiries having no specific bearing on research work will be handled by the American Welding Society, direct, through the newly appointed office of "Technical Secretary."

General Reports

Several important papers dealing with the needs for research on certain fundamental problems in welding, pressure vessels and structural welding, together with discussion of same were published in the May, 1927, issue of the *Journal of the American Welding Society.*

General Status of the A. B. W.

As pointed out in the introductory remarks, the American Bureau of Welding is now the recognized body for authentic, cooperative research in the welding field. The bureau is confining its attention to a few problems of major importance to the welding industry.

Published Reports

Recently the National Research Council has compiled a list of published reports of various committees of the Division of Engineering, including those on welding. This list includes also the more important papers published by the officers of the Bureau and the officers of the various research committee chairmen when such reports relate to the work of the Bureau or its various committees. A list of the reports as compiled by the Council is given below, with a few additions of those of recent date.

AMERICAN BUREAU OF WELDING

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Training course for oxy-acetylene welders. *Journal of the American Welding Society*, Vol. 2, No. 4, pp. 31-57, 1923. Reprinted as *Bulletin of the American Bureau of Welding*, No. 4. Apr., 1923. 30 pp.

Training course for electric arc welders. *Journal of the American Welding Society*, Vol. 3, No. 2, pp. 15-47, 1924. Reprinted as *Bulletin of the American Bureau of Welding*, No. 7. 1924. 35 pp.

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F. M. FARMER, Electrical Testing Laboratories.
A. C. FICKES, Lancaster Iron Works.
E. R. FISH, Heine Boiler Company.
C. H. HAUPT, Standard Oil Company of N. J.
J. S. HECK, Lloyd's Register of Shipping.
H. M. HOBART. General Electric Company.
D. S. JACOBUS, Babcock & Wilcox Company.
S. F. JETER, Hartford Steam Boiler Insp. & Ins. Company.
W. R. KREMER, Vilter Manufacturing Company.
J. C. MCCUNE, Westinghouse Air Brake Company.
A. O. MILLER, Reeves Brothers Company.
S. W. MILLER, Union Carbide & Carbon Research Laboratories.
H. F. MOORE, University of Illinois.
J. PARTINGTON, American Locomotive Company.
A. D. RISTEEN, Travelers Insurance Company.
L. H. ROLLER, Linde Air Products Company.
H. P. RUST, Welding Engineers, Inc.
H. S. SMITH, Prest-O-Lite Company.
A. M. SCAIFE, W. B. Scaife & Sons Company.
E. STEWART, U. S. Dept. of Labor, Bureau of Labor Statistics.

A. F. STIGLMEIR, New York Central Railroad.
B. STOUGHTON, Lehigh University.
L. S. THURSTON, General Electric Company.
W. L. WARNER, General Electric Company.
G. B. WATERHOUSE, Mass. Institute of Technology.
A. E. WHITE, University of Michigan.
H. L. WHITTEMORE, Bureau af Standards.
H. LE ROY WHITNEY, The M. W. Kellogg Company.
J. PRICE, The Griscom-Russell Company.
L. DOELLING, Alternate for W. R. Kremer.

By-Laws
AMERICAN BUREAU OF WELDING

ARTICLE I
Name

The name of this organization shall be the AMERICAN BUREAU OF WELDING.

ARTICLE II
Functions of the Bureau

(1) To act as an advisory body to the American Welding Society and to the Engineering Division of the National Research Council on matters pertaining to welding research.

(2) To act as a coordinating body in welding research and standardization.

(3) To advance the science and art of welding by stimulation of welding research and standardization.

(4) To do all other things incidental or conducive to the above-named objects.

ARTICLE III
Membership

The membership shall consist of—

(a) Twelve representatives appointed by the American Welding Society (selected by the Board of Directors of that Society) for their special fitness and interest in welding research.

(b) Two representatives from each Section of the American Welding Society, one from each Section to be a representative of the Research Committee of such Section and the other to be appointed by the Section to serve on the Ways and Means Committee of the Bureau.

(c) One representative or, upon vote of the Executive Committee, two representatives from each of the following Scientific Societies and Governmental Departments and other interested organizations accepting the invitation to become members.

American Bureau of Shipping.
American Electrochemical Society.
American Engineering Standards Committee.
American Institute of Electrical Engineers.
American Institute of Mining Engineers.
American Institute of Steel Construction.
American Physical Society.
American Railway Association.
American Society of Civil Engineers.
American Society of Mechanical Engineers.
American Society of Refrigerating Engineers.
American Society for Testing Materials.

Bureau Veritas.
Engineering Foundation.
Lloyd's Register of Shipping.
National Research Council.
New York Academy of Sciences.
Society of Automotive Engineers, Inc.
United States Department of Commerce, Bureau of Standards.
United States Navy Department.
The Federal Board of Vocational Training.

Additional Scientific Societies and Governmental Departments may be invited to appoint representatives to become members upon the approval of the Executive Committee.

(d) Certain members-at-large chosen because of their ability to advance the work of the Bureau. These appointments are to be made by the Executive Committee and shall not at any one time exceed twelve.

ARTICLE IV

There shall be no annual or other dues. Funds for the work of the Bureau shall be secured by voluntary contributions. The solicitation of such funds shall conform to the regulations of the National Research Council and of the American Welding Society.

ARTICLE V

Officers, Nominations and Elections

Section 1. The Officers of the Bureau shall be as follows: A Director, two Vice-Directors, a Secretary and a Treasurer.

Section 2. At the first meeting of the American Bureau of Welding the officers shall be elected by a majority vote of those present and voting, the nominating therefor being made by a committee of five appointed by the Chair. The officers so chosen shall hold office from the date of their election until the next following annual meeting of the Bureau and until their successors shall be elected and qualified.

Section 3. At each annual meeting an election shall be held to select officers of the Bureau for the ensuing year. The officers so chosen shall hold office until the next following annual meeting and until their successors shall be elected and qualified. Any officer shall be eligible for immediate reelection.

Section 4. An interim vacancy among the officers shall be filled by a majority of the members voting by letter ballot, the nominations therefor being made by any ten members in writing to the Secretary at least twenty days prior to the call for said letter ballot.

ARTICLE VI

Duties of Officers

Section 1. The Director shall have general supervision of the affairs of the Bureau subject to its direction. He shall preside at its meetings and shall be ex-officio a member of all committees.

Section 2. In the absence of the Director, a Vice-Director shall preside at meetings of the Bureau and otherwise perform the duties of the Director.

Section 3. The Secretary and Treasurer shall perform the duties usually appertaining to those officers in similar organizations.

ARTICLE VII

Committees

Section 1. The Director shall appoint an Executive Committee, which shall have such power as the Bureau may delegate to it from time to time. In general it will be the function of the Executive Committee to conduct the ordinary business of the Bureau.

Section 2. The Director shall appoint a Ways and Means Committee to devise ways and means for conducting the work of the Bureau.

Section 3. The Bureau shall create from time to time research committees, the Chairmen of which shall be appointed by the Executive Committee. The Chairmen of the several committees so created shall appoint the individual members thereof, subject to the approval of the Executive Committee, to the approval of the American Welding Society and to the approval of the National Research Council.

ARTICLE VIII

Meetings and Notices

Section 1. There shall be an annual meeting of the Bureau to be held on the same day as that of the annual meeting of the American Welding Society.

Section 2. Meetings of the Bureau shall take place at the call of the Director.

Section 3. Notices of all meetings of the Bureau shall be mailed to the members at least two weeks prior to the time of such meetings, except as otherwise provided in these By-Laws, and shall state the time and place of the meeting and the principal business to come before it.

Section 4. Fifteen members shall constitute a quorum.

ARTICLE IX

Voting by Proxies

Section 1. Voting by proxy shall not be allowed at any meeting of the Bureau or of any of its committees, except by a personal representative not otherwise entitled to vote.

ARTICLE X

Publications

Publications of the Bureau in the form of papers will in general be printed in the Proceedings of the American Welding Society. The Executive Committee shall have the authority to pass on all matters relating to publicity and publications of the Bureau and its committees.

ARTICLE XI

Parliamentary Rules

Section 1. Roberts' Rules of order shall be the governing parliamentary law of the Bureau in all cases not definitely provided by its By-Laws or its own rules.

ARTICLE XII

Amendments

Section 1. These By-Laws may be amended, repealed or added to by a majority vote of the members of the Bureau present at any regular meeting or at any special meeting duly called for that purpose.

Section 2. All proposed amendments, repeals or additions to the By-Laws shall be presented to the Secretary in writing at least thirty days prior to the regular or special meeting at which it is desired the same should be considered, and the Secretary shall send a notice which shall contain a copy of such proposal to the members of the Bureau at least ten days prior to such meeting.

Everyone identified with the Welding Industry should be a member of the American Welding Society.

Fill in the Application Blank given in the Advertising Section and send it in to the Secretary of the Society.

Catalogue of Membership

August 1, 1927

Honorary Members

Adams, Comfort A., Prof. of Eng. and Consulting Engineer, Harvard Engineering School, Pierce Hall, Cambridge, Mass.

Fouche, Edmund, President, Chambre Syndicate de L'Acetylene de la Soudure Autogene; (Res.) 104 Boulevard de Clinchy, Paris.

Thomson, Elihu, Consulting Engineer, General Electric Co., 22 Monument Ave., Swampscott, Mass.

LIST OF MEMBERS OF ALL GRADES

Arranged Alphabetically

EXPLANATORY NOTE

The following alphabetical list contains the names of members of all grades. The letter in parentheses immediately after each name indicates the class to which the member belongs. Where members desire to have their mail sent to their residence the home address is given and is preceded by (Res.). A list of members showing the geographical distribution follows the alphabetical list.

Abbott, Cecil A. (D), Acetylene Welder American Radiator Co., 480 LeRoy Ave., Buffalo, N. Y.

Adams, Comfort A. (E), Lawrence Prof. of Engineering, Harvard Engineering School, Pierce Hall, Cambridge, Mass.

Adamson, Daniel (B), Proprietor Joseph Adamson & Co., P. O. Box 4, Hyde, Cheshire, England.

Albert, Geo. M. (B), Superintendent, Western Gas Const. Co., Fort Wayne, Ind.

Aldrich, Wm. (B), Representative, Metal & Thermit Corp., South San Francisco, Cal.

Alexander, Peter (C), Research Engineer, General Electric Co., Thomson Research Laboratory, Lynn, Mass.

Allan, F. W. (B), President, Ferguson Allan Co., Fidelity Bldg., Buffalo, N. Y.

Allen, Guy F. (B), Structural Engineer, The Detroit Edison Co.; (Res.) 220 California, Royal Oak, Mich.

Ammann, Herman L. (B), Technical Director and Manager, Quasi-Arc Incorporated, 11 West 42nd St., New York, N. Y.

Anderson, E. S. (B), Superintendent, Anderson-Barngrover Mfg. Co.; (Res.) 73 Cleaves Ave., San Jose, Cal.

Anderson, James L. (B), Industrial Engr., Air Reduction Sales Co., 342 Madison Ave., New York, N. Y.

Angus, James (D), Electric Welder, Weirton Steel Co.; Box 552, Hollidays Cove, W. Va.

Ard, Ligon B. (D), Manager, Chase Companies, 2461 East 8th St., Los Angeles, Cal.

Arnison, Joseph W. (D), Welder, Benoni Welding & Cutting Co.; (Res.) 35a Victoria Ave., Benoni, Transvaal, South Africa.

Arnott, David (A), Chief Surveyor, American Bureau of Shipping, 24-26 Old Slip, New York, N. Y.

Ashline, G. L. (D), 214 Mural Ave., N. D. G., Montreal, Can.

Ashman, T. R. (C), Welder, Elec. & Acetylene, Standard Oil Co.; (Res.) 3312 E. 2nd St., Long Beach, Cal.

Atkinson, R. H. (B), Salesman, Page Steel & Wire Co., American Chain Co., Inc., 837 Pacific Bldg., San Francisco, Cal.

Austin, Calvin C. (D), Acetylene Welder, Sound Welding Co.; (Res.) 2075 Morris Ave., Bronx, N. Y. C.

Auten, Hurley (D), Arc Welder, American Car & Foundry Co.; (Res.) R. D. 1, Milton, Pa.

Axelson, Edwin C. (D), 241 7th St., Richmond, Cal.

Babcock, Court W. (B), Sales Engineer, Westinghouse Elec. & Mfg. Co., 10 High St., Boston, Mass.

Bachman, Elwood (C), Welding Specialist & Engineer, General Electric Co., 1016 Continental Bank Bldg., Salt Lake City, Utah.

Baker, F. H. (B), General Manager, Baker Mfg. Co., Saratoga Springs, N. Y.

Baker, John A. (B), Commercial Acetylene Supply Co., Inc., 71 Broadway, New York City.

Baker, Lawrence T. (B), Superintendent, Baker Iron Works, 950 North Broadway, Los Angeles, Cal.

Baldwin, John W. (D), Welder, Sou. Pacific R. R. Co.; Res.) 405 Westminster Ave., Alhambra, Cal.

Barker, George N. (C), Sales Engineer, General Electric Co., P. O. Box 732, Portland, Ore.

Barnes, William H. (C), Assistant Engineer of Surface Line, Boston Elevated Ry., 31 St. James Ave., Boston, Mass.

Barnes, Wm. W. (B), District Manager, Air Reduction Sales Co., Germantown and Allegheny Aves., Philadelphia, Pa.

Barron, P. F. (D), Acetylene Welder, (Res.) 952 East Ontario St., Philadelphia, Pa.

Barry, Alfred M. (B), President, St. Lawrence Welding & Engineering Works, Ltd., 485 St. James St., Montreal, P. Q.

Bartz, Emil J. (C), Superintendent, General Electric Co., Erie, Pa.

Bates, Clifford Whitman (B), Research Assistant to the Chief Engineer, Philadelphia Electric Co., 1000 Chestnut St., Philadelphia, Pa.

Bauer, Ernst (A), Electrical Engineer, U. S. Light & Heat Corp., Niagara Falls, N. Y.

Baumer, J. Harry (C), Welding Engineer, Genesee Welding Works; (Res.) 49 Anthony St., Rochester, N. Y.

Beall, John S. (A), President, Beall Pipe & Tank Corp., cor. Columbia Blvd. & Denver Ave., Portland, Ore.

Beard, Wm. F. (C), Welding Foreman, S. P. & S. R. R.; (Res.) 322 West 26th St., Vancouver, Wash.

Beath, L. B. (B), Vice-President, W. D. Beath & Son, Ltd., 394 Symington Ave., Toronto, Can.

Beck, Wesley J. (A), Director of Research, The American Rolling Mill Co., Middletown, Ohio.

Beebe, C. (B), Root Neal & Co., 178 Main St., Buffalo, N. Y.

Beers, LeRoy (C), Engineer, General Electric Co., Schenectady, N. Y.

Begtrup, Edward F. (B), Master Mechanic, Metal & Thermit Corp., 92 Bishop St., Jersey City, N. J.

Bellinghausen, Walter (C), Division Superintendent, Swift & Company, Plant Supt. Office, U. S. Yards, Chicago, Ill.

Benneke, Chas. F. (B), Salesman, John A. Roebling's Sons Co., 165 W. Lake St., Chicago, Ill.

Bennett, Arthur A. (C), Member of Firm, Reedsport Machine & Boiler Works, Reedsport, Ore.

Bennett, James C. (A), Mgr. Automotive Dept., Associated Oil Co., 1360 59th St., Emeryville, Alameda Co., Cal.

Benson, C. A. (D), Acetylene Welder, Berkeley Steel Cons., Inc.; (Res.) 5422 Shafter Ave., Oakland, Cal.

Berent, John (C), Proprietor, Lockport Boiler & Welding Works, 237 Market St., Lockport, N. Y.

Bergundthal, C. J. (B), Welding Supervisor, Southern Pacific Ry. Co., Room 1037, 65 Market St., San Francisco, Cal.

Bickel, John A. (B), Production Manager, Concrete Steel Products Co., Box 117 Firestone Park Sta., Akron, Ohio.

Bickerstaph, Robert (D), 323 Railroad St., North Baltimore, Ohio.

Bird, George (B), President and Treasurer, Bird-Potts Co., Inc., 376-78 Marietta St., Atlanta, Ga.

Bishop, J. O. (C), Foreman, Union Tool Co., 2021 Carson St., Torrance, Cal.

Bissell, A. G. (C), General Engineer, Westinghouse Elec. & Mfg. Co., P. O. Box 1015, E. Pittsburgh, Pa.

Blacksten, J. E. (C), Welder, Beall Tank & Pipe Corp., 684 E. 16th St. S., Portland, Ore.

Bleecker, W. H. (B), District Sales Manager, Page Steel & Wire Co., 2629 Grand Central Terminal, New York City.

Bliss, W. L. (C), Chief Engineer, U. S. L. Battery Corporation, Niagara Falls, N. Y.

Blodgett, L. S. (C), Simmons-Boardman Publishing Co., 30 Church St., New York, N. Y.

Bloodgood, C. M. (B), Manager, Air Reduction Sales Co., 7991 Hartwick St., Detroit, Mich.

Boissier, Arthur H. C. (B), Manager, Utah Compressed Gas Co., 362 Pierpont Ave., Salt Lake City, Utah.

Bolger, Michael (D), Welder, Electric, Standard Oil Co.; (Res.) 52 Simonson Ave., Mariner's Harbor, S. I., N. Y.

Booth, Henry (B), Sales Manager, Shawinigan Products Corporation, 110 William St., New York City.

Bornemann, Otto J. (D), Head Welder, Euclid Crane & Hoist Co., Euclid, Ohio.

Borsum, Finn (C), Salesman and Chief Clerk, A/S Sveiseindustri, 25 Hedemarksgt., Oslo, Norway.

Boulter, Elvin (D), Welding & Radiator Shop, J. J. Boulter & Son, Prop., 124 Haymarket Sq., Bangor, Me.

Bourque, Philip (D), Welder, Detroit Edison Co., 23 James East, River Rouge, Mich.

Bovard, W. P. (D), Sales Engineer, Ohio Brass Co., Mansfield, Ohio.

Bowers, Arthur S. (C), Partner in Welding, Sears & Bowers, Spring Garden and Fourth Sts., Easton, Pa.

Bowlus, Claude A. (B), Plant Equipment Engineer, Chrysler Motor Corporation, Highland Park, Mich.

Bowman, W. P. (B), Vice-President & Treasurer, John A. Roeblings Sons Co. of New York, 83 Liberty St., New York.

Boyd, F. George (D), Electric Arc Welder; Gen. Del., Proctor, Minn.

Boyd, Wilfred R. (C), Proprietor, Boyd Welding Co., 160 East 8th St., Erie, Pa.

Boyer, R. J. (D), Electric Arc Welder; (Res.) 314 2nd St., Monongahela, Pa.

Boylston, Herbert M. (B), Professor of Metallurgy, Case School of Applied Science, Cleveland, Ohio.

Bradbury, John (D), Welder, Canadian National Railways; (Res.) 59 Colonial Ave., Montreal, Can.

Bradshaw, Campbell (B), Managing Editor, Canadian Machinery, 143 University Ave., Toronto 2, Can.

Bradt, H. A. (C), Hummel Manufacturing Co., Montrose and LaSalle Sts., St. Louis, Mo.

Brady, W. M. B. (B), District Arc Welding Specialist, General Electric Co., 230 S. Clark St., Chicago, Ill.

Briggs, Clay (B), Chief Engineer, Empire Companies, Bartlesville, Okla.

Bright, Roy L. (C), Master Mechanic, Rogers Brown & Co., 26 Strathmore Ave., Buffalo, N. Y.

Brink, W. H. (D), Forge and Welding Shop Foreman, Firestone Tire & Rubber Co.; (Res.) 361 Mission Dr., Akron, Ohio.

Brophy, G. R. (C), Metallurgist, Research Laboratory, General Electric Co., Schenectady, N. Y.

Brown, Harold A. (D), Eastern Representative, Railway Equipment & Publication Co., 424 W. 33rd St., New York.

Brown, Howard H. (C), Editor, Marine Engineering and Shipping Age, Simmons-Boardman Publishing Co., 30 Church St., New York.

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Brown, W. M. (B), Vice-President, Brown-Hutchinson Iron Works, 1831 Clay Ave., Detroit, Mich.

Brown, W. P. (B), Partner, Brown Bros. Welding Co., 223 Main St., San Francisco, Cal.

Browne, Robert L. (B), N. Y. & N. E. District Sales Mgr., Metal & Thermit Corp., 141 Milk St., Boston, Mass.

Brumder, H. O. (A), President, Pressed Steel Tank Company, West Allis, Wis.

Bruton, James J. (B), Service Engineer, Oxweld Acetylene Co., 1310 Santee St., Los Angeles, Cal.

Bryce, C. K. (B), Works Manager, Oxweld Acetylene Co., Inc., 646 Frelinghuysen Ave., Newark, N. J.

Bull, Robert A. (C), Consulting Engineer, Electric Steel Founders Research Group, 541 Diversey Parkway, Chicago, Ill.

Bunker, Wilfred R. (C), Operator, Detroit Street Railway; (Res.) 237 Buena Vista, East Highland Park, Mich.

Burdett, Lester F. (D), Welder, Sound Welding Co., Inc., 574 E. 140th St., New York, N. Y.

Burke, James (A), President, Burke Electric Co., Erie, Pa.

Burkhart, A. W. (C), Salesman, Williams & Co., 901 Penna. Ave., N. S. Pittsburgh, Pa.

Burkhart, J. F. (C), Manager Operator, Champion Welding & Mfg. Co.; (Res.) 101 Urban St., Buffalo, N. Y.

Burkhart, L. H. (B), Chief Engineer, Struthers-Wells Co., Warren, Pa.

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Buzzard, G. F. (D), Electric Welder, Heine Boiler Co., Route No. 3, Phoenixville, Pa.

Cairns, Samuel B. (B), Dist. Sales Manager, Page Steel & Wire Co., 644 Union Trust Bldg., Pittsburgh, Pa.

Calcutt, F. M. (C), Chief Engineer of Signals & Telegraphs, Victorian Railways, Spencer St., Melbourne, Australia.

Calder, David L. (B), Shop Superintendent, California Steel Products Co., 452 Bay St., San Francisco, Cal.

Calral, M. B. (D), Electric and Acetylene Welder, California & Hawaiian Sugar Co., Box 75, Rodeo, Cal.

Camp, Arthur D. (B), Research Engineer, U. S. Aluminum Co., 2050 Elmwood Ave., Buffalo, N. Y.

Candy, A. M. (B), Engineer, Arc Welding Engr. Dept., Westinghouse Electric & Mfg. Co., General Engineering Dept., East Pittsburgh, Pa.

Card, H. S. (B), Editor, The Welding Engineer, 608 S. Dearborn St., Chicago, Ill.

Cardno, Cornelius (D), Welder, 320 N. 77th St., Seattle, Wash.

Carlin, L. C. (B), Manager, The Purox Company, 136 Liberty St., New York, N. Y.

Carter, Glenn O. (A), Consulting Engineer, The Linde Air Products Co., 30 E. 42nd St., New York.

Carter, W. J. (C), Shop Foreman, Llewellyn Iron Works, 1200 N. Main St., Los Angeles, Cal.

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Chapman, A. B. (C), Welding Supervisor, C. & O. Huntington Shop; (Res.) 1821 9th Ave., Huntington, W. Va.

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Chapman, V. J. (C), Engineer, Welding, General Electric Co.; (Res.) 25 Lakewood Ave., Schenectady, N. Y.

Cheakas, George (C), Acetylene Welder, Box 1464, Vernon, Tex.

Cheffins, Eric Eustace Stanley (D), Oxy-Acetylene Welding (Aircraft), Canadian Vickers Co., Montreal; (Res.) 1447 Theodore Ave., Maisonneuve, Montreal.

Chipman, Fred W. (A), Treasurer, International Engineering Works, Inc., Box "B," Framingham, Mass.

Christensen, L. H. (C), Welding Supervisor, Heintz Mfg. Co., Front & Olney Ave., Philadelphia, Pa.

Christensen, R. R. (C), Acetylene Operator, C. & S. Welding Service; (Res.) 450 E. 44th St., Portland, Ore.

Christie, J. L. (B), Metallurgist, Bridgeport Brass Co., Bridgeport, Conn.

Churchward, Alexander (A), Consulting Engineer, Wilson Welder & Metals Co., Inc., Wilson Bldg., Hoboken, N. J.

Cipperly, Elmer J. (C), Welding Equipment Specialist, General Electric Co., 5201 Santa Fe Ave., Los Angeles, Cal.

Clack, J. F. (B), General Manager, Commonwealth Oxygen & Accessories, Ltd., Foy St., Balmain, Sydney, N. S. W.

Clark, Roger W. (D), Electric Arc Welder, General Electric Co.; (Res.) 1004 Delamont Ave., Schenectady, N. Y.

Clevenger, G. H. (D), Consulting Metallurgist, U. S. Smelting, Refining & Mining Co., Room 900, 55 Congress St., Boston, Mass.

Close, G. B. (B), Secy. and Sales Mgr. The Ohio Chemical & Mfg. Co., 1177 Marquette St., Cleveland, Ohio.

Cohen, Fred (B), Vice-President, Metal & Thermit Corporation, 120 Broadway, New York, N. Y.

Coldwell, O. B. (A), Vice-President, Portland Electric Power Co., Electric Bldg., Portland, Ore.

Cole, C. J. (C), General Foreman Boiler and Blacksmith, General Electric Co., Norway Place, Pittsfield, Mass.

Coleman, Geo. J. (D), Welding Instructor, 8731 S. Michigan Ave., Chicago, Ill.

Colkitt, James N. (C), Salesman, J. A. Roeblings Sons Co. of California, Los Angeles, Cal.

Collins, D. Robert (D), Welder, Freeport Sulphur Co., Box 246 Freeport, Tex.

Condit, Kenneth H. (C), Editor, American Machinist, McGraw-Hill Publishing Co., Inc., 10th Ave. at 36th St., New York City.

Conway, J. D. (B), Secretary-Treasurer, Railway Supply Manufacturers' Association, 1841 Oliver Bldg., Pittsburgh, Pa.

Conway, M. Leo (D), Welder, Wayside Welding & Garage, 3770 E. 93rd St., Cleveland, Ohio.

Cook, Fred R. (D), Owner, Cook's Oil Co., Seymour St., San Jose, Cal.

Cosgro, Fred A. (D), Welder Foreman, International Smelting Co.; Gen. Del., Miami, Ariz.

Costa, Joseph Charles (D), Boiler Maker Foreman, Cal. & Hawaiian Sugar Refining, 325 Arriba St., Martinez, Cal.

Costello, Wm. F. (B), Works Manager, The Dura Company, 1336 W. Bancroft St., Toledo, Ohio.

Covey, Paul B. (D), Proprietor, Manchester Engineering & Welding Co., P. O. Box 327, Manchester, N. H.

Cox, James C. (C), Foreman Elkon Works, Inc., 515 Gregory Ave., Weehawken, N. J.

Crabtree, W. (B), Manager Australian Oxygen & Industrial Gases Pty., Ltd., 550 Latrobe St., Melbourne, Australia.

Crahan, H. Thomas (D), Welder, Pennsylvania R. R.; (Res.) 1122 10th St., Altoona, Pa.

Cramb, David L. (C), Arc Welding Demonstrator, General Electric; (Res.) 507 Maxwell Ave., Royal Oak, Mich.

Cramer, L. L. (C), Welding Supervisor, Kansas City Structural Steel Co., 21st & Metropolitan Ave., Kansas City, Mo.

Creighton, W. H. (B), Boiler, Pipe & Tank Manufacturer, Creighton Boiler & Welding Works, East End Hawthorne Bridge, Portland, Ore.

Crouch, Ray C. (B), Mechanical Engineer, Riter-Conley Mfg. Co., Oliver Bldg., Pittsburgh, Pa.

Crowe, John J. (A), Eng. in Charge Apparatus Research & Development Dept., Air Reduction Co., 100 Forrest St., Jersey City, N. J.

Crowl, W. B. (B), Engineer, Roscoe Moss Company, 4360 Worth St., Los Angeles, Cal.

Crutcher, Wm. A. (B), District Manager, Air Reduction Sales Company, 113 Plum St., St. Louis, Mo.

Cumberland, John C. (C), Welding Specialist, General Electric Co., Witherspoon Bldg., Philadelphia, Pa.

Cunningham, Bert (D), Welding Foreman, Kansas City Structural Steel Co., P. O. Box 31, Shawnee, Kan.

Currey, John J. (B), Superintendent, L. O. Koven & Bro., Inc., 154 Ogden Ave., Jersey City, N. J.

Dalgleish, R. H. (A), Chief Engineer, The Capital Traction Company, 36th and M Sts., N. W., Washington, D. C.

Daly, Michael A. (D), Electric Welder, Ashmore, Benson, Pease, Ltd., 17 Lumley St., Stockton-on-Tees, Co. Durham, England.

Danforth, George H. (B), Contracting Engineer, Jones & Laughlin Steel Corp., 311 Ross St., Pittsburgh, Pa.

Daniels, Ernest (D), Welding Foreman, Associated Oil Co., Associated, Cal.

Davis, Alton F. (C), Vice-President, The Lincoln Electric Co., Coit Rd. and Kirby Ave., Cleveland, Ohio.

Davis, Arthur P. (C), Civil Engineer, East Bay Utility Dist., 1924 Broadway, Oakland, Cal.

Davis, Augustine (B), Manufacturer, The Davis Welding & Mfg. Co., 1110 Richmond St., Cincinnati, Ohio.

Davis, C. W. (C), R. D. Thomas & Co., 125 Church St., New York, N. Y.

Davis, Fred (D), Welding Specialist, G. E. Co., Lynn, Mass.; (Res.) 90 Springdale Ave., East Saugus, Mass.

Davis, Roncisco H. (C), Electric Arc Welder, U. S. Navy Yard, Puget

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Dawson, Joseph R. (B), Metallurgical Engineer, Union Carbide & Carbon Research Labs., Inc., Long Island City, New York.

Deacon, John (F), Student, 80 St. George St., Toronto, Canada.

De Burn, Arlan E. (C), Mgr. Engineering Sales, Pacific Pipe & Supply Co., 1002 Santa Fe Ave., Los Angeles, Cal.

Dee, William F. (D), Electric Welder, 422 Sherman St., Waco, Texas.

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American Bureau of Shipping, 50 Broad Street, New York, N. Y. President, C. A. McAllister. A society for the survey and registry of shipping, whose committees of management comprise the representative shipowners, underwriters, shipbuilders and marine engineers of the United States. The Bureau exists solely for the benefit of these various shipping interests, all accrued funds being used for its maintenance and the improvement of the service. The Bureau has a large corps of surveyors stationed at the various ports of the world. Welding for ships comes under its supervision.

American Chain Company, Inc., Bridgeport, Conn. Manufacturers of Weed Chains, Bumpers, Levelizers, Pliers, Tire Lock Chains, Towing Chains, Sling Chains, Campbell Cotter Pins. The largest makers of Welded and Weldless Chain in the world. The American Chain Company has developed chain making to its present state of perfection through the maintenance an experimental division second to none, and ACCO Chain is accepted as standard in all lines of trade, and for every use for which chain is adaptable.

The **American Rolling Mill Company, Middletown, Ohio.** Manufactures Armco-Ingot Iron, the purest iron produced in commercial quantities today. The

Page Steel & Wire Company, Pittsburgh, Pa., sole licensee for the manufacture of "Armco Page" electrodes and "Armco Page" gas welding wires, specialty products made from Armco-Ingot Iron, the scientifically de-gasified metal which conforms to rigid chemical specifications. Its homogeneity and freedom from detrimental impurities insures strong, durable welds.

Anchor Post Fence Company, Garwood, N. J. Manufactures Electrically Welded Iron Railings and Gates and Galvanized Wire Fences, known as Chain Link. The company has perfected a railing in which pickets and rails of each panel are welded together, forming a rigid, unbreakable structure. Railing panels made under this process, and spanning 10 feet from post to post, will sustain a load of eight to nine hundred pounds without permanent deflection. Thousands of feet of this type of railing now in use have proved their superiority.

Associated Oil Company, 79 New Montgomery Street, San Francisco, Cal. Producers, refiners and distributors of petroleum products. Manufacturers of "Cycol" lubricating oils and greases. Distributing facilities in California, Oregon, Washington, Nevada, Territory of Hawaii and Philippine Islands. Rail, steamer and pipe line transportation. Storage capacity, 24,294,300 barrels. Refining capacity, 75,000 barrels daily.

The Babcock & Wilcox Company, 85 Liberty Street, New York, N. Y., are manufacturers of water tube steam boilers, both stationary and marine, steam superheaters, economizers, air heaters and chain grate stokers. One of their subsidiary companies, The Babcock & Wilcox Tube Company, manufactures seamless steel boiler tubes, while another, the Fuller Lehigh Company, manufactures pulverized coal preparation, handling and burning equipment, and furnace water walls. The principal works are at Bayonne, N. J.; Barberton, Ohio; Beaver Falls, Pa., and Fullerton, Pa.

Bastian-Blessing Co., The, 240-258 East Ontario Street, Chicago, Ill. Manufacturers of Rego equipment for the oxy-acetylene and oxy-hydrogen process and all other gases used for welding, brazing and cutting; also complete line of equipment, consisting of fifteen different style torches, thirty-six different style regulators and ten different style acetylene generators.

Beall Pipe & Tank Corporation, Columbia Boulevard and Denver Avenue, Portland, Ore. Successors to Coast Culvert & Flume Company. Manufactures corrugated culvert, metal flume, electric welded pressure pipe, lock system gravity pipe, metal tanks for all purposes, irrigation and drainage gates, metal specialties.

Bethlehem Steel Company, Bethlehem, Pa. This company owns and operates seven steel-producing plants, which are located at Bethlehem, Pa.; Johnstown, Pa.; Coatesville, Pa.; Lackawanna, N. Y.; Lebanon, Pa.; Sparrows Point, Md., and Steelton, Pa., and two plants devoted solely to manufacturing at Elizabeth, N. J., and Wilmington, Del. Products range from pig iron and other blast-furnace products to finished machinery of exceptional size and capacity. The raw materials are obtained from mines and quarries owned by the company, making possible the selection of the materials going into the various products of all plants.

Edward G. Budd Manufacturing Company, Twenty-fifth Street and Hunting Park Avenue, Philadelphia, Pa. Manufacturers of "ALL-STEEL" automobile bodies and steel units for open and closed cars. The various units are welded in sub-assembly jigs, then put in the complete assembly jigs and welded together, forming a single steel unit. Welds eliminate loose joints, rattles and squeaks. The all-steel construction results in considerable saving in weight, increased strength, and 60 per cent increase in driving vision in closed cars due to narrowed windshield posts made possible by use of steel.

Burke Electric Company, Erie, Pa. Company manufactures direct and alternating current dynamos and motors, high-tension molded products and special switchboard fittings; variable voltage type welding generators in single and two operator types, requiring no exciter, in which all regulation of current is accomplished by turning hand wheel which moves the brushes giving "Micrometer current adjustment." Constant potential type equipments are also manufactured with portable controllers or stationary panels for multiple operator metallic arc welding or with panels arranged for carbon welding and cutting.

The **Capital Traction Co., Thirty-sixth and M Streets, Washington, D. C.** Company operates over 73.98 miles of track. Three electric welding outfits are used for maintenance and construction work, and some work is also done with the oxy-acetylene and thermit processes. Repair shops are equipped to do welding repairs to car equipment, sub-station and power-station equipment and on track. Five welders are constantly busy on this work. Rail joints are all welded when new track is installed.

W. A. Case & Son Mfg. Co., 220 Delaware Avenue, Buffalo, N. Y. Company was founded in 1853, with headquarters at Buffalo, N. Y., the boiler and tank factory being located at Norristown, Pa., and the products of which plant are sold with country-wide distribution through the regular trade channels. The oxy-acetylene welded products manufactured by the company are range boilers and expansion, storage, pneumatic, gasoline and air tanks.

Central Steel & Wire Company, 4545 So. Western Boulevard, Chicago, Ill., and 5001 Bellevue Avenue, Detroit, Mich. This firm has been producing welding wire for over fifteen years, and carries a great diversity of wires and rods, both ferrous and non-ferrous, as listed in the advertising section of this issue. They specialize in the solution of special welding problems and encourage the trade to patronize their Service Bureau, which is maintained without charge for this purpose.

Chicago Bridge & Iron Work, 37 West Van Buren Street, Chicago, Ill. The Chicago Bridge & Iron Works regularly employ welding processes throughout many details essential to the fabrication of tanks and plate work, pipe connections, manhole hatches and covers, base plates for small columns and numerous other details. In field work, bottoms and roofs of oil storage tanks of all sizes are welded throughout, shell plates of small tanks are welded. It is also used for numerous other details, such as attaching shell plates to the bottom angle, etc.

Chicago Steel & Wire Company, 103rd Street and Torrence Avenue, Chicago, Ill. Manufacturers of the WELDITE Line of Welding Rods for both gas and electric welding. This includes three grades of low carbon rods in Coppered, Bare Bright, Green Surfaced and Flux Coated finishes. Also High Carbon, Nickel and Chrome Vanadium steels. Included in the WELDITE Line are rods meeting all of the American Welding Society's specifications.

Commercial Acetylene Supply Co., Inc., 71 Broadway, New York, N. Y. Company manufactures acetylene, acetylene cylinders, acetylene plant equipment (complete or in parts), and acetylene generators. Equipped to give prompt and efficient service on any quantity of acetylene through plants, warehouses and truck deliveries.

Electric Arc Cutting and Welding Co., 152-156 Jelliff Avenue, Newark, N. J. The company has in stock every facility for arc welding and cutting. Prompt delivery on transformer welders, generator sets and all accessories. Features "universal" power supply apparatus. ALTERNARC machine can be made to operate from any power supply, and their generator gives both direct and alternating current, so that either Direct Arc or Alternating Current Arc, Spot, Butt or Seam Welders can be operated therefrom. Important and extraordinary welding, repair or structural contracts are entered into in any part of the world.

Frick Company, Waynesboro, Pa. This company builds ice-making and refrigerating machinery and equipment, and uses electric and oxy-acetylene welding in making various parts of refrigerating systems. Pressure vessels, such as ammonia receivers, oil separators, accumulators, condensers and brine coolers are all of welded construction. Also, continuous pipe coils, headers and bends are welded. Use welding for tanks, pans and for repairing castings, and are interested in the art in all its phases, as it is indispensable in above classes of work, also do forge welding.

General Electric Co., General Offices, Schenectady, N. Y. Manufactures various sizes and types of direct current arc welding equipment. Constant energy, single operator generators arranged for belt drive, or for direct connection to electric motors or gas engines. Resistor type arc welders. Automatic arc welders which maintain constant arc length and welding temperature, including complete machines for tank or pipe welding. Semi-automatic arc welders, which combine automatic welding head with flexible guide and welding tool, held by operator. Constant potential generators, single or multi-operator, direct connected to standard electric motors.

Gibb Welding Machines Company, Bay City, Mich. Branch offices in all principal cities. This company builds arc, spot, and seam (line) welders. It specializes in production welding equipment for all kinds of containers from small cans to tanks. Has built a great variety of special automatic welding equipment, both spot and seam. Maintains a large Research and Development Department for the study of special welding problems. Manufactures arc welding electrodes and supplies.

C. H. Hollup Corporation, 3333 West Forty-eighth Place, Chicago, Ill. Manufacturers of Wanamaker Flux Coated Electrodes for welding of cast iron, mild steel, high carbon steel, high manganese steel, high carbon rails and self hardening alloys. Rex Processed Bare Electrodes for welding mild steel, bronze, brass, cast iron. Rex Copper Coated Welding Rods (for oxy-acetylene welding) pure iron and low carbon steel. Rex Arc Welding Accessories, including Face Shields, Helmets, Cable, Lenses, Sand Blast Outfits and Preheaters. Arc Welding Machines: driven by motors and gasoline engines—200 and 300 amperes.

Internatonal Engineering Works, Inc., Framingham, Mass. Manufacturers of high pressure steam boilers, special plate work for paper, textile, chemical, rubber, slaughtering and rendering industries. Main office and works at Framingham, Mass.

K-G Welding and Cutting Co., Home Office and Factory, 515 West Twenty-ninth Street, New York, N. Y. Manufacturers of and dealers in gas welding and cutting equipment and supplies. Distributors and Service Stations in New England, Baltimore, Chicago, Staten Island, Albany, Philadelphia, Montreal, Toronto, Indianapolis, Detroit, Perth Amboy, West Alexandria (Ohio), Pittsburgh, Clifton, and Paterson, N. J.

Lincoln Electric Co., Cleveland, Ohio. Company manufactures induction motors from 1 hp. to 250 hp. Manufactures elevator motors in which the torque per ampere of current supply is exceptionally high, and 200, 300, 400, 600, 800 and 1200 ampere welding machines which have drooping characteristics requiring no resistance in series with the arc. Also manufactures automatic carbon arc welding machines for production work which has welding speeds as high as 75 or 200 feet per hour on some classes of work.

Linde Air Products Company, 30 East Forty-second Street, New York, N. Y. Starting with the process that first separated oxygen from the other elements in the air on a large scale, the Linde organization has developed commercially until it now operates a national chain of 44 plants and 107 warehouses. Along with this remarkable growth in size has grown up a thoroughly technical and practical service to its customers in the use of Linde products.

Metal and Thermit Corporation, 120 Broadway, New York. The Metal and Thermit Corporation manufactures thermit for use in welding rails, compromise joints, special work for street railway companies, locomotive frames, yokes and other heavy sections for steam railroads, as well as such sections as crank shafts, stern frames of ships and for the welding of all types of heavy sections, and also for butt welding of pipes up to 6 inches in diameter. The Metal and Thermit Corporation also manufactures the necessary accessories and furnishes molding sand, crucibles, preheaters and other equipment necessary for this type of work.

Alexander Milburn Company, 1416 W. Baltimore Street, Baltimore, Md. Manufactures a complete line of welding and cutting apparatus, including: Acetylene medium pressure generators, 30 to 500 lb. capacity; acetylene generating and compressing plants, industrial and commercial types up to 1000 lb. capacity; welding torches and cutting torches; combination cutting and welding torches operated by merely changing the tips; special torches, made to order; regulators for regulating delivery of gases up to 3000 lb.; preheaters and oil burners; manifolds for oxygen acetylene, or other gases; accessories, paint guns and sprays.

National Carbide Sales Corporation, 342 Madison Avenue, New York, N. Y. Manufactures and distributes National Carbide through approximately 175 warehouses located in all principal cities. National Carbide is packed in 100-lb. heavy steel drums for use in generating acetylene, for oxy-acetylene processes and for house lighting; also in 25-lb. drums, 10-lb. cans (packed six to a case), and 2-lb. cans (packed 24 to a case) for use in miners' and other carbide lamps.

New Orleans Public Service, Inc., 201 Baronne Street, New Orleans, La. Company does a general lighting and power business in addition to main-

motors.

taining a street railway system. It operates 224 miles of track and has 625 motor passenger cars; 42 trail passenger cars, 1 motor freight, 42 motor service and 30 trail service cars. President, H. B. Flowers.

Northwestern Electric Company, Pittock Block, Portland, Ore. Supplies electric light and power and steam-heat services in Portland, Ore. Electric service supplied also in Camas, Kalama, Ridgefield, Vancouver, Washougal and Woodland, Wash., and Rainier, Ore.

Oxweld Acetylene Co., 30 East Forty-second Street, New York, N. Y. Under the trade names of Oxweld and Prestoweld, this company manufactures a complete line of apparatus and supplies which make possible real efficiency of oxy-acetylene welding and cutting. From the acetylene generator to the welding and cutting blowpipe, special analysis welding rod and flux, the Oxweld Acetylene Company's products are the result of thorough research. Engineers and trained operators are maintained in all district offices to instruct in and extend the use of oxy-acetylene welding and cutting.

Page Steel & Wire Company, General Offices, Bridgeport, Conn. Manufacturers of Page Armco and Steel Electrodes or Gas Welding Wire. Welding wire conforms to A. W. S. specifications and are especially processed for the type of welding for which they are recommended. Also manufacturers of guy strand, signal track bands, all commercial high and low carbon, plain or galvanized wire, special analysis wire and hot rolled rods. Fence for factory, farm or lawn. Woven wire Hi-Way Guard—Page Panel Partitions.

The Petroleum Iron Works Company, Sharon, Pa. Fabricators and erectors of tanks of all kinds and sizes; oil refinery equipment; tank cars; welded pressure and vacuum stills; welded pressure pipe, and all classes of light and heavy steel plate construction, welded or riveted. Steel plate plants at Sharon, Pa., and Beaumont, Texas. Also manufacturers of welded steel shipping bilged barrels and straight-side drums for liquids, semi-liquids and solids. Barrel and drum plants at Sharon, Pa., and Beaumont, Tex.

Portland Electric Power Company, 329 Alder Street, Portland, Ore. Carries on a general business of electric light and power generation and distribution. Hydro-generating capacity 105,500 hp.; steam 76,000 hp. Serves 70 cities and communities in Oregon and Washington, principally the city of Portland and the Willamette Valley in Oregon. Population served, 415,000. Company serves and operates Portland City Street Railway System and four interurban lines. Thirty-nine modern gas and gas-electric buses operated in conjunction with City and Interurban Railway System.

Portland Oxygen & Hydrogen Company, The, 596 Sherlock Avenue, Portland, Ore. Producers of not less than 99.5 per cent pure oxygen and 99.9 per cent pure hydrogen. Distributors of Purox acetylene, Purox welding and cutting apparatus, welding rods and supplies—everything for gas welding and cutting.

Pressed Steel Tank Co., Milwaukee, Wis. Manufacturers of seamless drawn steel acetylene cylinders since the beginning of the compressed acetylene industry. Seamless steel bilged barrels with full removable head suitable for shipping 500 lb. of carbide, also seamless steel barrels for shipment of oils and gasoline. Drums with removable cover made in two sizes, 500 and 1000 lb. for shipping or storing carbide, and meeting all Interstate Commerce requirements. Seamless drawn steel tanks for high or low pressures.

Prest-O-Lite Co., The, Inc., 30 East Forty-second Street, New York, N. Y. With a manufacturing and distribution system of the greatest flexibility, this company has proved itself indispensable to welding. It has contributed to the oxy-acetylene welding industry a marketing service of Prest-O-Lite acetylene and returnable steel cylinders which is unexcelled. The manufacture of Prest-O-Lite is carried on in thirty-one plants which stock 102 warehouses in industrial centers throughout the country. In cylinders of convenient capacities, Prest-O-Lite is used wherever portable supplies of acetylene are required.

Reid-Avery Company, Twenty-first and Washington Avenue, Philadelphia, Pa. Manufactures medium carbon, low carbon mild steel, and covered electrodes for electric welding. Also rods for oxy-acetylene welding in plain and copper coated finish. All "Raco" welding wires are guaranteed to meet the American Welding Society Specifications in every particular.

John A. Roebling's Sons Co., Trenton, N. J. Manufacturers of welding wire, high or low carbon or high manganese steel, bronze, brass or copper

pany does a general lighting and power business in addition to main-

for electric or gas welding; reels for automatic or semi-automatic welding equipment; electric arc welding machine cable; electrode holder cable. Manufacturers of wire rope, wire rope slings for heavy or light duty, bare or insulated copper wires and cables. Engineering data and catalogs sent upon application.

Shawinigan Products Corporation, 110 William Street, New York City. Manufacturers of Shawinigan Carbide at Shawinigan Falls, Quebec; Keokuk, Iowa, and Anniston, Ala., with national distribution of the product for oxy-acetylene welding and cutting of metals, carbide home lighting and cooking, for miners' cap lamps, inspection lanterns, flare lights, etc.

Shell Company of California, 200 Bush Street, San Francisco, Cal., producers, refiners and marketers of petroleum products. Distributing facilities in California, Oregon, Washington, Nevada, Arizona, British Columbia and Territory of Hawaii. Manufacturers and marketers of Shell Brand of gasoline, distillates, kerosene, lubricating oils, greases and fuel oils. Refineries at Martinez, Coalinga and Wilmington, Cal. Marine loading terminals, San Francisco Bay and San Pedro Harbor.

Standard Oil Company, San Francisco, Cal. Welding is extensively used in both construction and maintenance work by all the operating departments of this company.

Third Avenue Railway System, 130th Street and Third Avenue, New York. The Third Avenue Railway System operates 300 miles of trolley lines in New York City and municipalities north of it, carrying 350 million passengers annually. Welding by electric arc, gas and thermit processes is extensively used in its shops and on its tracks. It regards the work of the American Welding Society as of great value to the Electric Railway industry, and it carries membership in the Society for its employees in charge of welding work.

Thomson Electric Welding Co., Lynn, Mass. Manufacturers of butt welders—capacity from 28 gage iron or steel wire to rods or other shapes 30 square inch cross section, also used for brass and copper. Spot welders—capacity two pieces 28 gage steel or iron to two pieces ½ in. total thickness; will also weld brass, tin, galvanized iron or aluminum. Seam welders used for making air or watertight seams, stock, iron or steel not over ⅛ inch; also used for seam welding brass.

Torchweld Equipment Co., 224 No. Carpenter Street, Chicago, Ill. Manufacturers of the Torchweld line of gas welding and cutting equipment consisting of: Torchweld non-flash welding torches, Torchweld stay-lit cutting torches, Torchweld positive gas pressure regulators, Torchweld non-flash lead burning and brazing torches, Torchweld accessories and supplies. Every requirement of gas welding and cutting industry is covered by the Torchweld line. All Torchweld torches have incorporated in their design the exclusive patented Torchweld non-flash construction.

Una Welding & Bonding Co., Cleveland, Ohio. Manufacturers of Una Welders (Dynamotor Type) for general welding purposes, both carbon and metal electrode, single and double operator. The light weight, compact yet sturdy construction and convenient mounting of these welders make them particularly well suited for both general shop welding and outside construction work. Una seam welded rail joints, Una direct copper to steel welded bonds, Una electrodes for all classes of electric welding. A research department is maintained for study of special welding problems.

The Union Carbide & Carbon Research Laboratories, Thompson Avenue and Manley Street, Long Island City, N. Y., were organized to carry out research work for the Union Carbide and Carbon Corporation and its subsidiaries. Among their activities is work on oxy-acetylene welding and cutting processes. A staff of chemists and metallurgists conduct investigations leading to the improvement of present methods and the discovery of new ones, this being carried out in conjunction with The Linde Air Products Company, the Prest-O-Lite Company, Inc., Oxweld Acetylene Company, and the Union Carbide Sales Company.

Union Carbide Sales Company, 30 East Forty-second Street, New York, N. Y. About thirty-three years ago an effort to produce metallic calcium in an electric furnace resulted in the production of calcium carbide instead. Union Carbide Company pioneered and developed the production of calcium carbide of high purity. Union Carbide Sales Company, through its remarkable distributing system, now consisting of more than 195 warehouses in as many different cities, has made Union Carbide easily available everywhere. They supply Union Carbide in generator sizes direct to the consumer.

John A. Roebling's Sons Co., Trenton, N. J. Manufacturers of welding wire, high or low carbon or high manganese steel, bronze, brass or copper

United States Gauge Company, 44 Beaver Street, New York. The company has specialized in the production of Bourbon tube pressure gages which will meet the severe service demands of this industry. Briefly, summarized, these are: First—Safety to the operator. Second—Lightness and sensitiveness of mechanism, at the same time preserving the requisite strength and wearing qualities of the moving parts. Third—Complete control of the incoming gases, so as to eliminate sudden strains on the tube itself. Fourth—Thoroughly seasoned tubes, thereby eliminating false registration.

USL Battery Corporation, Niagara Falls, N. Y. Manufacturers of USL electric arc welders, single operator, variable voltage type in both 200 and 300 ampere capacities for continuous service. Manufactured with DC or AC motor for all commercial voltages and frequencies, gasoline engine or belt drive, portable, semi-portable and stationary types. USL storage batteries for automobiles, radio, railroad car lighting, farm lighting and signal service.

Welding Engineer, 608 South Dearborn Street, Chicago, Ill. H. S. Card, Editor. The Welding Engineer is an accurate source of information and advisor on every phase of welding. Both manufacturing and repair problems by every process of welding is discussed fully in this valuable monthly publication. In your plant there is a man who needs timely and accurate information about welding. He should know what is being done in other plants to reduce costs and increase efficiency. Write for sample copy. Price, $3 in the United States and Canada; $4 abroad.

Western Electric Company, Incorporated, 195 Broadway, New York, N. Y. Manufacturers of telephones and telephone equipment for the companies constituting the Bell Telephone System; also purchaser of equipment and supplies for that system. Manufacturer or licensor of certain by-products outside the field of wire communication, including the Western Electric Sound Projection System for synchronizing motion pictures and sound; the Public Address System; electrical methods of recording sound; Permalloy type of high speed submarine telegraph cable; radio broadcasting equipment and other types of radio telephone apparatus.

Western Pipe & Steel Company of California, 444 Market Street, San Francisco, Cal.; 5717 Santa Fe Avenue, Los Angeles, Cal. Fabricators, designers and erectors of oil storage tanks, brine tanks, bolted tanks, galvanized tanks, surface pipe, corr. galv. culverts, gas holders, gas generators, smoke stacks, welded steel pipe, oil well housings, well casing, penstocks, refuse burners, oil refinery equipment, dredge pipe, standpipes, structural steel, tunnel lagging, boilers, truck tanks, pressed steel work, air receivers, hydro-pneumatic tanks, gasoline and lubricating oil tanks, and ice cans.

Westinghouse Air Brake Co., Wilmerding, Pa. Manufacturers of Air Brake Apparatus for Steam and Electric Railways, Brakes for Automotive Vehicles, also Air Compressors, Reservoirs and related Apparatus for Railways and general industrial use.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa. Manufactures 200, 300 and 400 ampere single operator, portable or stationary welding motor generator outfits. Multiple operator arc welding equipments of 300, 500, 750 or 1000 amperes capacity can be furnished for metal or carbon welding or cutting. Arc welding rheostats for operation from mine and electric railway trolley circuits are manufactured. Also manufactures an automotic arc welding machine, which will operate satisfactorily from any of the above welding motor generator sets.

Wilson Welder & Metals Co., Inc., Wilson Building, Hoboken, N. J. Wilson Type "S" Welding Machines, one operator motor-generator sets, gasoline engine and belt driven types; 25 to 300 amperes, and 50 to 400 amperes; two operator motor-generator sets, 25 to 600 amperes and 50 to 800 amperes. Wilson "Color-tipt" welding wire is manufactured in various grades and diameters for welding steel, cast iron, malleable iron, brass, bronze, copper, Monel Metal and aluminum.

York Manufacturing Company, York, Pa. This company builds ammonia compression, ammonia absorption and CO_2 ice making and refrigerating machinery. Also manufactures a complete line of ammonia and CO_2 valves, fittings and auxiliary equipment for complete ice making and refrigerating plants. These products include a great variety of pressure vessels and piping, in the fabrication of which welding is employed extensively.

able everywhere. They supply Union Carbide in generator sizes direct to the consumer.

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Torchweld is the acknowledged leader in the gas welding and cutting equipment field because Torchweld design is original and Torchweld superior construction insures long and satisfactory service.

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WELDITE E—No. 18 Green Surfaced for electric welding is the smoothest running electrode ever offered users of welding. Sold at the price of bare electrodes.

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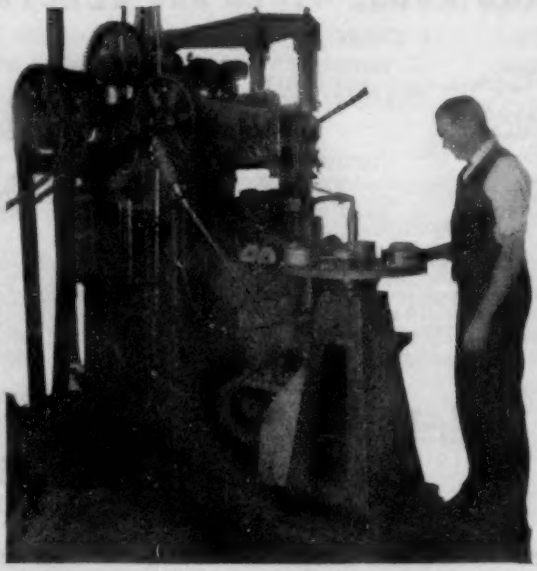
Problem Solved by Projection Method

AN INTERESTING development in spot welding practice has recently been made by The John Warren Watson Co., Phila., by substituting multiple projection welding in place of the ordinary foot operated single type weld.

In the making of stabilators six welds are made to join the cover and drum. It is obvious that a considerable saving in time and cost would be made if all these welds were made simultaneously by the projection method in which a number of welds are made at each closing of the electrodes. In this method small points or projections are formed of a uniform size on a punch press on the surface of one part where the welds are to be.



Parts production increased to 16 pieces per minute by adoption of *ELKONITE* dies on Thompson 75-PA heavy-duty welder.

For this development a standard Thompson 75PA single spot welder was utilized, and the lower electrode was replaced by a table upon which 6 dies were mounted and which, actuated by a Geneva movement, rotates a sixth of a revolution at the end of each welding cycle.

Dies of various grades of copper were tried and proved to be the weak link in the development on account of being too soft, because after a few welds the projections on the material made impressions in the dies which increased rapidly in size and spread the current away from the weld, resulting in poor quality welds.

Elkonite, the new electrode material, finally gave the satisfactory results; this, on account of the fact that it is a combination of tungsten and copper, having a Brinnel hardness of 225 as compared with 82 for hard copper, and a compressive strength of 208,000 lbs. per sq. in., while that of hard copper is only 58,000 lbs. It is these inherent qualities of *Elkonite* which made the Watson experiment successful and increased production possible.

Heretofore copper dies produced but 50 completed pieces, *Elkonite* however produces 5000 and more before resurfacing becomes necessary, and *Elkonite* can be resurfaced at least 3 times.

The *Elkonite* dies are designed so that they may be removed readily, duplicate sets are provided and changes are made on regular schedule, thus minimizing die failure during operation and its consequent loss in production, and work thrown out. The machine welds at the rate of 16 pieces per minute, nearly 1000 per hour, each piece containing six separate uniform welds made simultaneously. This machine has now been in service several months.

Projection welding may be the solution to your production problems. Our Engineering Staff will be glad to assist you upon request.

For further information write

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WELDING WIRE RODS

"SENECA"

IRON STEEL QUALITY SERVICE TRADE MARK

SENECA BRAND
For Electric and Gas Welding

GRADE No. 1. For Electric Welding, a low carbon soft wire with a smooth, soft action in the arc.

GRADE No. 2. For Electric Welding —meets the American Welding Society specification E No. 1B.

Can furnish flux coated rods on either of the above grades.

GRADE No. 3. Acetylene Welding— A low carbon smooth rod suitable for all general repair shop use.

GRADE No. 4. Acetylene Welding— The purest iron stock and meets the American Welding Society specification G No. 1A.

All grades supplied for various requirements.

Highest Quality Guaranteed

Sales Representatives wanted commission basis.

THE SENECA WIRE & MFG. COMPANY **Fostoria, Ohio**

Established 1905

The Trade Knows What

K-G

means on

Welding and Cutting Equipment

K-G WELDING & CUTTING CO., Inc.

515 West 29th Street

Phone Chickering 0996-7-8 New York City

Head and Eye Protection for Welders

Protection affects production. Welders must have welding comfort before they can turn out fast good welding.

The following equipment is furnished with Willson-Weld Glass, (cuts out over 99% of the injurious rays) protected by cover glass.

Welding Goggle No. L81.
Thick tough fiber. Adjustable bridge.
$27.00 per doz.

Welding Helmet No. 200.
Break front. Well ventilated and balanced. Cuts out over 99% of the harmful rays. $12.60 each.

Welding Goggle No. L1.
Special Bakelite. Wide vision. Metal box. $36.00 per doz.

Welding Handshield No. 1.
Strong fiber. Thick vulcanized handle. Chin guard for flash protection.
$7.50 each.

Prices are f.o.b. shipping point

WILLSON GOGGLES, INC.

Reading, Pa., U. S. A.

Ask for complete catalog.

Manufacturers of safety goggles, welding goggles, welding helmets and handshields, and respirator masks for dust, spray, smoke and fumes.

Before you settle on the type of machine get the users viewpoint

They say

(a new list in each issue)

"We can say that we have noticed a considerable economy in current consumption."

* * *

"Have not had one minute's trouble with our "Stable-Arc" Welder."

* * *

"We are able to save many castings which would otherwise have to be scrapped."

* * *

"We have never kept a strict cost record on our welder and are unable to tell you just what savings in dollars and cents this machine has made us, but will say we would not be without the machine."

Any Lincoln office below will put you in touch with a user near you whose experience covers many types of welders. Get his viewpoint based on experience.

LINCOLN "Stable-Arc" WELDER

Branch Offices
Baltimore
Boston
Buffalo
Charlotte, N. C.
Chicago
Cincinnati
Detroit
Des Moines
Grand Rapids

The Lincoln Electric Co.

General Offices and Factory:
Cleveland, Ohio

The Lincoln Electric Co. of Canada, Ltd., Toronto-Montreal

Branch Offices
Indianapolis
Milwaukee
Minneapolis
New York City
Philadelphia
Pittsburgh
Rochester
St. Louis

Distributing agencies in all principal cities.

Exclusive Agencies with Stock:
Ft. Worth, Texas
New Orleans
Los Angeles
San Francisco

Courtesy of
New York Central
Railroad

Locomotive Frames Successfully Welded with Tobin Bronze

No stronger proof of the dependable strength of Tobin Bronze welds can be offered than that locomotive frames repaired three years ago with this trade-marked bronze are still in daily use and that locomotive cylinders welded with Tobin Bronze ten years ago are today giving satisfactory service.

Several of the largest railroad repair shops have adopted Tobin Bronze welding as standard practice in repairing broken locomotive frames and cylinders. The low welding temperature required when applying Tobin Bronze usually eliminates pre-heating and dismantling; thus making it possible to repair many engine breaks on the tracks with the least possible interruption to service.

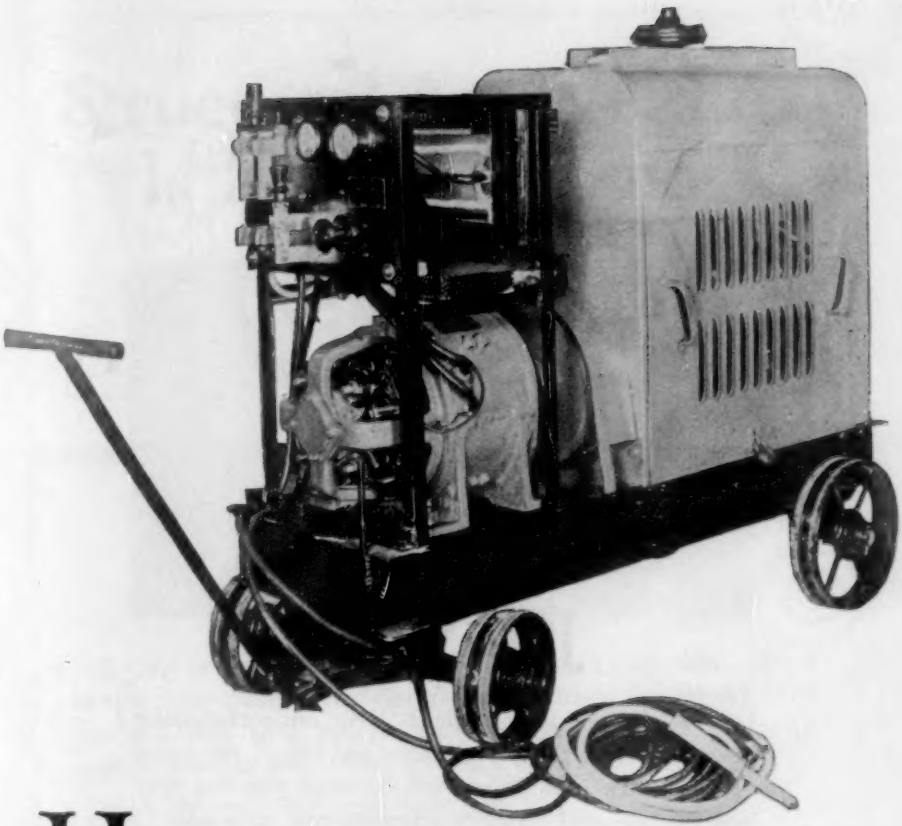
Tobin Bronze welding rods are made exclusively by The American Brass Company and have the trade-mark "Tobin Bronze" rolled in every rod. They may be obtained from leading distributors of welding supplies.

THE AMERICAN BRASS COMPANY
GENERAL OFFICES: WATERBURY, CONNECTICUT
Offices and Agencies in Principal Cities
Canadian Mill: ANACONDA AMERICAN BRASS LIMITED
New Toronto, Ontario

TOBIN BRONZE
REGISTERED U.S. PATENT OFFICE
WELDING RODS

EXCLUSIVELY AN ANACONDA PRODUCT

Distributing agencies in all principal cities.
New Orleans
San Francisco



Have you seen this WILSON Machine?

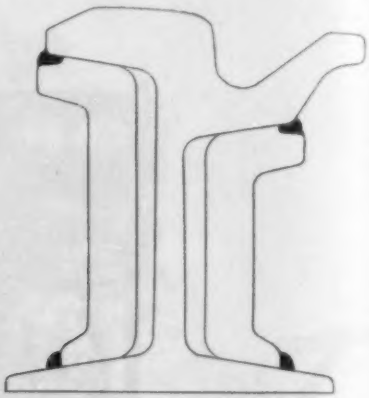
THIS Wilson Type S single operator gasoline-engine-driven electric welding machine has been tried and proved throughout the world. It is a complete, self-contained unit, easily moved, and operates by the simplest control panel yet devised. It has a range of 25 to 250 amperes, and welds with electrodes $\frac{1}{16}$" to $\frac{1}{4}$" in diameter. 20 H.P. Continental Engine. Weight, 1600 Pounds. Write for full information, Export prices on request.

$1100.00 f. o. b. Hoboken, N. J.

WILSON WELDER & METALS CO. INC., WILSON BLDG., HOBOKEN, NEW JERSEY

WILSON

WELDING MACHINES AND WELDING WIRE



"WELD PLATES"

for

EFFICIENT, ECONOMICAL

JOINTS!

Do you believe in statistics? Rely on performance records? If so the performance records of the many "Weld Plates" now in use will convince you that they lead the bar-weld joints in efficiency and economy.

"Weld Plates" represent the most modern welding practice. They are the strongest and most up-to-date plates rolled especially for electric welded joints. Note the shape—the grooves for retaining plenty of weld metal along the upper edges—the wide contact areas at top and bottom—the suitability for the use of short bolts.

A trial will convince you of their efficiency and economy.

SEE OUR EXHIBIT—BOOTH 122 E, DETROIT CONVENTION, SEPT. 19-23

THE RAIL JOINT COMPANY

165 Broadway, New York

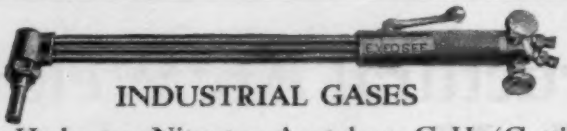
Structural Arc Welding Is Now Accepted!

Below is given a list of buildings that have been welded in the metropolitan district alone by either the DUALARC or ALTERNARC apparatus. We are already partially experienced in structural welding. May we serve you?

Theatre, 161st St. and Morris Ave., New York City
Marcus L. Ward Home, 70,000 ft. roofing, Maplewood, N. J.
Bound Brook Theatre, Bound Brook, N. J.
New Maplewood Theatre, Maplewood, N. J.
Fordham Road and Jerome Ave. Theatre, N. Y. C.
Theatre, Mt. Morris Ave. and 106th St., N. Y. C.
Theatre on 86th St. and Lexington Ave., N. Y. C.
Mont Eden Ave. and 176th St. Theatre, N. Y. C.
Broad Street Theatre, Elizabeth, N. J.
Completely welded house at 766 Carrol Pl., Teaneck, N. J.
Building at 152-156 Jelliff Ave., Newark, N. J.
Parkway Baths, Brighton Beach, N. Y.
Halstead Theatre, S. Orange Ave., Newark, N. J.
Masonic Temple, Broad St., Elizabeth, N. J.
Theatre, First Ave. and 86th St., N. Y. C.
New Theatre bet. 53rd and 54th Sts., N. Y. C.
Ridgewood Theatre, Myrtle and Wyckoff Aves., Brooklyn, N. Y.
Westbury Theatre, Westbury, L. I.
Wood Ave. Theatre, Linden, N. J.
Woodbridge Theatre, Woodbridge, N. J.
McCombs Road Theatre, cor. Tremont Ave., N. Y. C.
Theatre, Canal and Ludlow Sts., N. Y. C.
Highland Theatre, Highland Park, N. J.
Lyndhurst Theatre, Ridge Road, Lyndhurst, N. J.
Theatre, Jerome Ave. and Fordham Road, N. Y.C.
Factory Building, New Lidgerwood Plant, Bayway, N. J.
Prudential Bldg., Academy & Halsey Sts., Newark, N. J.

ELECTRIC ARC CUTTING & WELDING CO.

152-156 Jelliff Ave., Newark, N. J.



INDUSTRIAL GASES

Oxygen, Hydrogen, Nitrogen, Acetylene, C. H. (Cutting Gas)

Engineering Service: Installation of Complete Oxygen and Hydrogen Plants and Gas Distributing Systems.

Knowles Electrolytic Plants for Producing Hydrogen

Knowles Patented Cells are safe, simple, easy to install, automatic, low in first cost and maintenance, and flexible in operation. Can be furnished in any size up to 15,000 amperes.

Hydrogen 99.9%. Oxygen 99.8% Pure.

Cutting and Welding Equipment: EYEOSEE and INTERNATIONAL cutting and welding torches, regulators, acetylene generators. The best built, most efficient and economical line made.

Supplies and Accessories: I. O. C. stud valves, patented packingless high-pressure valve, safe and easily operated. Complete line of supplies for Gas Plants and Welding Shops—oxygen testing sets, charging lines, goggles, asbestos gloves and mats, welding rods and wire. *Write for Literature.*

INTERNATIONAL OXYGEN CO.

I.O.C. SYSTEM
INDUSTRIAL GASES

American Pioneer Manufacturers of Oxygen
Selling Agents: International Acetylene Co. Newark, N. J.
Plants at Newark, N. J.; Verona, Pa.; Toledo, Ohio
Offices at New York and London, Eng.

If You Want the Best Specify

Hollup Welding Wire and Equipment

WANAMAKER FLUX COATED ELECTRODES

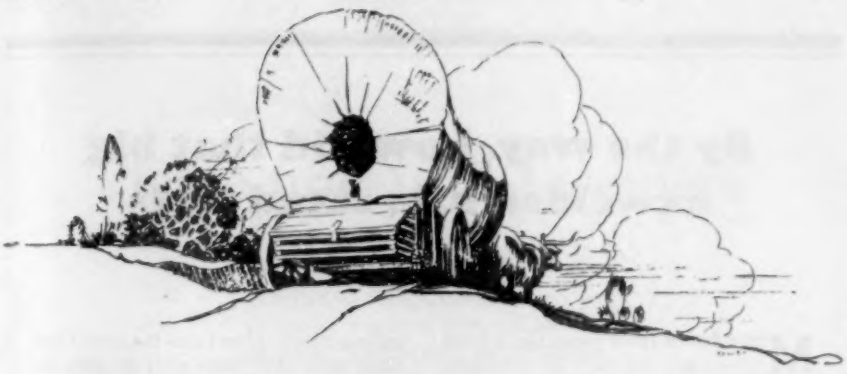
REX PROCESSED BARE ELECTRODES
(Above covered by Hollup Patent No. 1,466,587)

REX GAS WELDING RODS

REX ARC WELDING ACCESSORIES

HOLLUP ARC WELDING MACHINES

C. H. HOLLUP CORPORATION
3333 W. 48th Place, CHICAGO, ILLINOIS



Pioneering courage

WHEN an industry has become great, one is likely to forget that in the beginning the odds were overwhelmingly against it and that its very life depended on one thing—the courage of the men behind it.

So it is with Union Carbide. The dramatic accident of the discovery of calcium carbide, by men who later founded the Union Carbide Company, fired their imaginations with its great industrial possibilities.

Difficulties must have seemed insuperable. Yet in the face of these odds a process that would yield uniform and high quality product was developed, new uses for carbide and its child acetylene were discovered and equipment that would make these uses practical was invented.

Today, the great welding and cutting industry with its innumerable applications, the thousands of farms lighted with acetylene and the cheap and efficient mine and marine lighting systems, are a few of the things that stand as monuments to the pioneer courage that made them possible.

UNION CARBIDE SALES COMPANY
Unit of Union Carbide and Carbon Corporation

UCC

Carbide and Carbon Building, 30 East 42d Street, New York
Peoples Gas Building, Chicago, Ill. Balfour Bldg., San Francisco, Cal.

By the way, how did that big oxwelded kiln stand up?*

MORE THAN three years ago a large rotary kiln was built by oxwelding. It was a notable piece of welding construction — 8. ft. in diameter and 125 ft. long, made of ⅝-in. steel plate. At the time it was thought remarkable that the tolerance of ⅝-in. should be so easily met with welded construction.

Now, after three years of operation, it is fair to ask, is it still working satisfactorily?

The answer is—Yes.

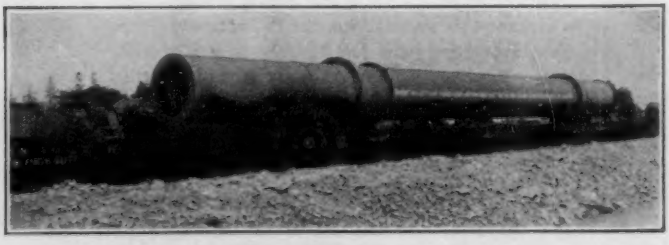
It is one of a battery of three kilns used in lime burning. The other two are riveted. The oxwelded kiln is dust-tight and running true on its trunions. As an operating unit it is beyond criticism.

Some convincing tests were made on these kilns with an extensometer. They showed beyond question that the oxwelded kiln was in better shape after two and a half years than the riveted ones. "Slippage" at riveted joints was found to be two and a third times as great as the stresses warranted. Stresses calculated from these measurements showed that the welded kiln could have been made of ½-in. plate instead of ⅝-in.; whereas a riveted kiln of the lighter plate would have shaken itself to pieces. This would mean a saving of eight tons of steel and a corresponding lowering of bending, handling, and erecting costs for oxwelding.

Recent oxwelding developments have made it possible to weld much heavier plate with no greater tolerance limits.

The experience with this pioneer kiln has started a revolution in tank construction, thanks to the strength and ruggedness of the welded joints. And there are today some of the oldest and most reliable manufacturers of tank construction engaged in this class of work.

THE LINDE AIR PRODUCTS COMPANY
Unit of Union Carbide and Carbon Corporation
UCC
General Offices: Carbide and Carbon Building, New York
37 PLANTS · 30 East 42d Street · 107 WAREHOUSES



LINDE OXYGEN

*No. 8 of a series of advertisements on the engineering phases of oxy-acetylene welding and cutting. Send for the booklet entitled: "Engineering and Management Phases of Oxwelded Construction."

"Please find us 30 welders"

SIMILAR REQUESTS come in to many Oxweld district offices because contractors, construction companies, and industrial men generally have come to realize that Oxweld is in touch with every kind of oxy-acetylene development and knows where good welders can be located.

Oxweld certainly does not want to become an employment agency, yet this is a definite and valuable clearing house service for Oxweld customers, which we are glad to undertake.

And again, thousands of welders who use Oxweld blowpipes also know the Oxweld organization and trust it. That is high tribute indeed.

OXWELD ACETYLENE COMPANY
Unit of Union Carbide and Carbon Corporation
CHICAGO 3642 Jasper Pl. UCC SAN FRANCISCO 1000 Mission St.
LONG ISLAND CITY, N. Y.
Thompson Ave and Orton St.
STOCKS IN 30 CITIES
In Canada: Dominion Oxygen Company, Ltd., Toronto

Oxweld
WELDING AND CUTTING APPARATUS

The "putting-on" tool

Do you remember the days of the sky-hook, the left-handed monkey wrench and the putting-on tool? They were grand old shop gags for green hands.

But there *is* a putting-on tool. It is the Oxweld welding blowpipe. It puts on metal where metal is needed. A shaft worn thin can be built up to the proper size. Shear tables and crusher jaws that are ready for the scrap pile can be put back to work by putting on a little metal. And undersized parts can be reclaimed by this modern method.

Nor is that the whole story, for, with welding rods of Haynes Stellite or special alloy steels, the new "put-on" surface can be made better and actually wears longer than the original.

Do you know where the putting-on tool can help you in your business? It pays to be up-to-date.

THE PREST-O-LITE COMPANY, INC.
Unit of Union Carbide and Carbon Corporation
UCC
General Offices: Carbide and Carbon Building
30 East 42d Street, New York
31 Plants—88 Warehouses

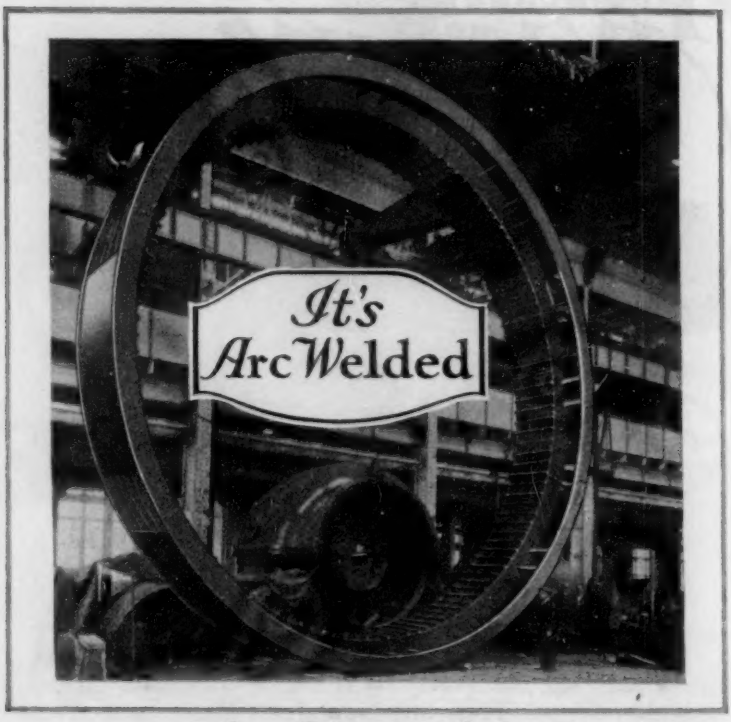
22 years old and still growing

Prest-O-Lite
DISSOLVED ACETYLENE

Roebling Welding Wire

ROEBLING Welding Wire makes strong, tough welds, is positively uniform throughout all shipments and conforms to all standard specifications.

John A. Roebling's Sons Company
Trenton, New Jersey



The Giant of Conowingo

General Electric furnishes to the Welding Industry:
WD Arc Welders—designed for one operator
Constant Potential Sets—for several operators
Arc Welding Resistors—for mining and traction companies
Automatic Sets—for repetition work
Complete information and bulletins available at your nearest G-E office.

This G-E generator frame for the Conowingo water-power development, is a better frame because it is completely fabricated by arc welding. It is not only lighter, but stronger—there can be none of the hidden defects sometimes present in castings.

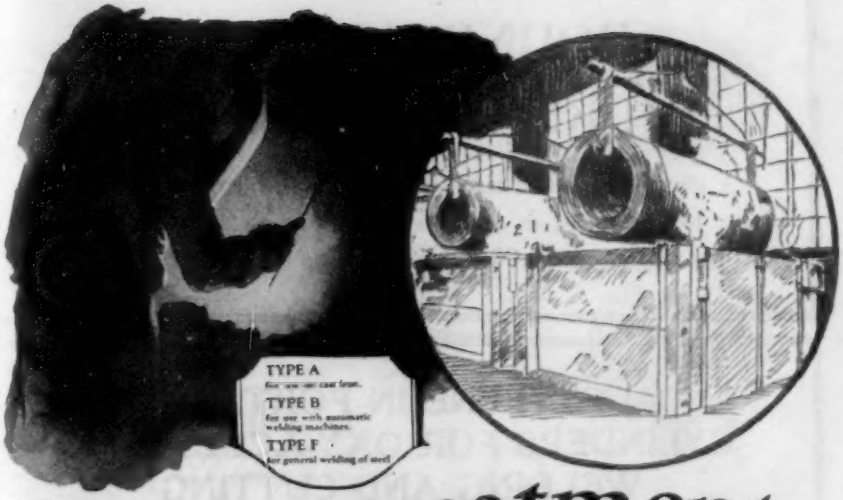
Fewer and simpler processes are involved from drafting room to finished frame. There is less drafting, no pattern work, no foundry work, less machining—and there is a smaller outlay for equipment.

Today is the time for fabricators of iron and steel to begin using this new method of construction. Forge ahead now by getting in touch with your nearest G-E office.

530-32D

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES



It's the treatment that counts

Ordinary welding wire sputters and dissipates because of segregated moisture and hydrogen which explodes under the heat of the arc.

In the Type "F", G-E Welding Electrode moisture and hydrogen are reduced to an absolute minimum.

Substances are introduced which help to produce a smoother, free flowing arc.

Type "F" can save money for you. This special General Electric method of treatment helps to produce stronger welds—makes the electrode easier for an operator to handle—helps him to do more work. And Type "F" is not any more expensive than ordinary bare wire.

In absolute reliability of operation and over-all efficiency, G-E Arc Welders are unequalled. They are available in all sizes, all types—for either hand or automatic operation—for one or more operators.

One of our special G-E Welding Electrode Distributors will be glad to tell you more about it.

For automatic welding Type B, G-E Welding Electrode is best. The concentrated arc, confined by encasing the flux around the core in a sheath, gives remarkable penetration and *higher speed* welding.

Special Distributors for G-E Welding Electrodes

American Steel Exp. Co., 10 South 18th St., Philadelphia, Pa. also 601 Granite Bldg., Pittsburg, Pa.

Bird-Potts Co., Atlanta, Ga.

Capital Electric Co., Salt Lake City, Utah.

Robert M. Hartwell, 353 East 2nd St., Los Angeles, Cal.

Hendrie & Bolthoff Mfg. & Supply Co., Denver, Colo.

Industrial Sup. Co., Inc., 329 East Second St., Los Angeles, Cal.

Matthews Electric Sup. Co., 1823 First Ave., Birmingham, Ala.

P. F. McDonald & Co., 17 King Terminal, Boston, 27, Mass.

National Welding Equip. Co., 223 Main Street, San Francisco, Cal.

W. A. Ramsey, Ltd., 76 Queen St., Honolulu, Hawaii.

Rust, Neal & Co., Buffalo, N. Y.

Joseph T. Ryerson & Son, Inc., Chicago, Ill. Cincinnati, O. Detroit, Mich. St. Louis, Mo.

Seattle Hardware Co. Seattle, Wash.

Southern Electric Co., Baltimore, Md. Charlotte, N. C. Norfolk, Va. Richmond, Va.

Southwest General Elec. Co., Dallas, Texas. Houston, Texas. Oklahoma City, Okla.

Strong, Carlisle & Hammond Co., Cleveland, Ohio.

Union Iron Works, Spokane, Wash.

Oliver H. Van Horn Co., Inc., 533-534 Camp Street, New Orleans, La.

Virginian Electric Inc., Charleston, W. Va.

Welding Service Co., 50 Church Street, New York, N. Y.

A. J. Wilson Co., Inc., 120 Liberty St. New York, N. Y.

GENERAL ELECTRIC

MERCHANDISE DEPARTMENT, BRIDGEPORT, CONNECTICUT

BOUND VOLUMES JOURNAL NOW READY

A number of Bound Volumes of the Journal for 1926 have been bound in attractive book form. Members may obtain copies at $5.00, non-members $10.00.

ACETYLENE IN PORTABLE CYLINDERS FOR OXY-ACETYLENE WELDING AND CUTTING

Do you understand our free loan cylinder plan? If not, we are glad to explain

Supplied in the following size cylinders:

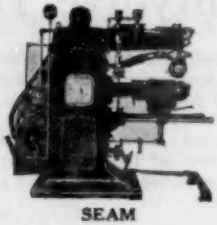
10" x 30"—capacity 125 cu. ft.
12" x 36"— " 225 " "
12" x 44"— " 275 " "

Prompt and efficient service on any quantity through plants and warehouses and truck deliveries.

Commercial Acetylene Supply Co., Inc.
(Main Office) 71 Broadway, New York City, N. Y.

BRANCHES:
613 Trust Co. of Georgia Bldg., Atlanta, Ga.
80 E. Jackson Boulevard, Chicago, Ill.
553 Monadnock Bldg., San Francisco, Cal.

SPOT



SEAM

See OUR EXHIBIT NATIONAL STEEL & MACHINE TOOL EXPOSITION DETROIT CONVENTION HALL Sept 19-25 BOOTH 150

ARC

For Production Electric Welding Machines

Gibb Welding Machines Company

Bay City, Michigan

New York—Philadelphia—Cleveland—Cincinnati—Detroit—Buffalo
Chicago—St. Louis—Los Angeles—Toronto—Montreal

National Carbon Products

For Electric and Gas Welding Operations

For Gas Welding

National Welding Carbon Products are highly refractory and are designed to withstand the extreme temperatures encountered in gas welding operations. National Welding Carbon Blocks, Rods, Paste and Flour are very desirable for all gas welding operations requiring the use of molds, cores or dams for the protection of all parts requiring shielding from the heat of the torch.

For Electric Arc Welding

National Welding Electrodes have been designed especially to meet the requirements of all electric carbon arc welding or cutting apparatus. Whether you work with a large or small current, there is a National Carbon Electrode which will give you complete satisfaction.

There are also National Welding Carbon Blocks, Rods, Paste and Flour for molds, cores or dams in all arc welding processes.

Write us explaining your production problems or construction jobs. The use of National Carbon Products may help considerably in making these operations more efficient. Our sales engineers are at your service.

NATIONAL CARBON COMPANY, INC.
Cleveland, Ohio San Francisco, Cal.

Unit of Union Carbide and Carbon Corporation

Emergency Service Plants

CHICAGO, ILL. 551 West Monroe St.
PITTSBURGH, PA. 7th Floor, Arrott Power Bldg. No. 2 Barker Place
NEW YORK, N. Y. 357 West 36th St.
BIRMINGHAM, ALA. 1824 Ninth Ave., N.

THERMIT

1902 — Twenty-five Years — 1927

Our engineering organization starting with a scientifically correct principal twenty-five years ago has developed the Thermit process to its present highly efficient state.

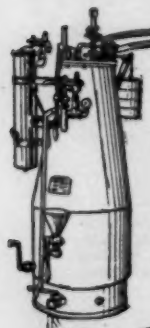
Today it is inexpensive, proven, practical and simple in its application to all classes of work involving the repair of medium and heavy size sections of iron and steel.

WELDING

Metal & Thermit Corporation

120 Broadway, New York

Pittsburgh Chicago Boston S. San Francisco Toronto



Why Experiment?

Torches
Regulators
Generators
Compressors
Manifolds
Preheaters
Paint Sprays
Carbide Lights

Catalog 547

SINCE the infancy of the industry, expert engineers and skilled workmen have maintained the predominance of Milburn Equipment.

Its acceptance as standard equipment by large industrials, railroads and Government Departments the world over exemplifies Milburn leadership.

THE ALEXANDER MILBURN CO.
Baltimore, Md.

Welding high Manganese Steel with UNA Rod No. 700 produces a weld metal of the same characteristics as the original parent metal.

A generous sample on request.

UNA WELDING AND BONDING COMPANY
1619 Collamer Avenue, Cleveland, Ohio

Welding Processes
Welding Rods

UNA

A.C.-D.C. Welders
Welding Supplies

CUT OFF ALONG THIS LINE

MEMBERSHIP APPLICATION BLANK

AMERICAN WELDING SOCIETY

33 WEST THIRTY-NINTH STREET
NEW YORK, N. Y.

.....192..

Secretary:

I hereby apply for Class.....Membership in the

.....Section of the AMERICAN

WELDING SOCIETY and attach hereto remittance of $..... for first annual dues. Remittance will be refunded in the event of rejection of applicant. I also agree to abide by the Constitution and By-Laws of the Society and By-Laws of the Section.

Name .....

Present occupation .....

Name of Company and Address .....

Residence .....

Address for mailing .....

.....

.....

.....

.....

.....

Applicant is requested to state here length of welding experience and processes involved, also to record any technical or mechanical experience.

References: (1. .....

(at least two) (2. .....

Proposed by .....

(See other side)

CUT OFF ALONG THIS LINE

QUALIFICATIONS FOR MEMBERSHIP

Extract from By-Laws

ARTICLE I.

Section 1. Individuals having received the approval of a majority of the Membership Committee shall become members of this Society upon the payment of dues, except in the cases of honorary members who shall be elected by unanimous vote of the full Board of Directors.

Section 2. Membership shall be divided into five classes:

Sustaining members, being individuals or individuals delegated by corporations, firms, partnerships, etc., interested in the science and art of welding, with full rights of membership.

Annual dues..... $100.00

Members, being individuals interested in the science and art of welding, with full rights of membership. Engineers or individuals competent by experience or training to plan or direct welding operations are eligible to this class.

Annual dues..... $20.00

Associate members with right to vote but not to hold office, except in Sections as may be provided for by the By-Laws of the Section. Supervising welders, inspectors and skilled operators, with three or more years' practical experience in welding, are also eligible to this class.

Annual dues..... $10.00

Operating members, who are welders or cutters by occupation, without the right to vote or hold office except in Sections as may be provided for by the By-Laws of the Sections.

Annual dues, United States and Canada $5.00
Other countries..... $10.00

Student Members, who are actually in attendance at any one of the recognized colleges and approved trade schools, without the right to vote or to hold office except in sections as may be provided for by the By-Laws of the Section.

Annual dues..... $2.50

Each Page Welding Wire or Electrode is stamped plainly with name and grade and every bundle carries a distinctive tag. There is no confusion — no guesswork—in use, even where the material has been stored in bins.

The welder is certain of uniform welding qualities too. For every wire is carefully processed. Production costs are cut to a minimum. To make sure —Page Wire is shop tested to make certain it will stand up under job conditions.

Large stocks carried by our distributors at convenient shipping points provide nation-wide service. Let us send you samples for testing. Your name and address brings them.

PAGE STEEL AND WIRE COMPANY

Bridgeport, Connecticut

An Associate Company of the American Chain Co., Inc.

District Sales Offices: Chicago New York Pittsburgh San Francisco

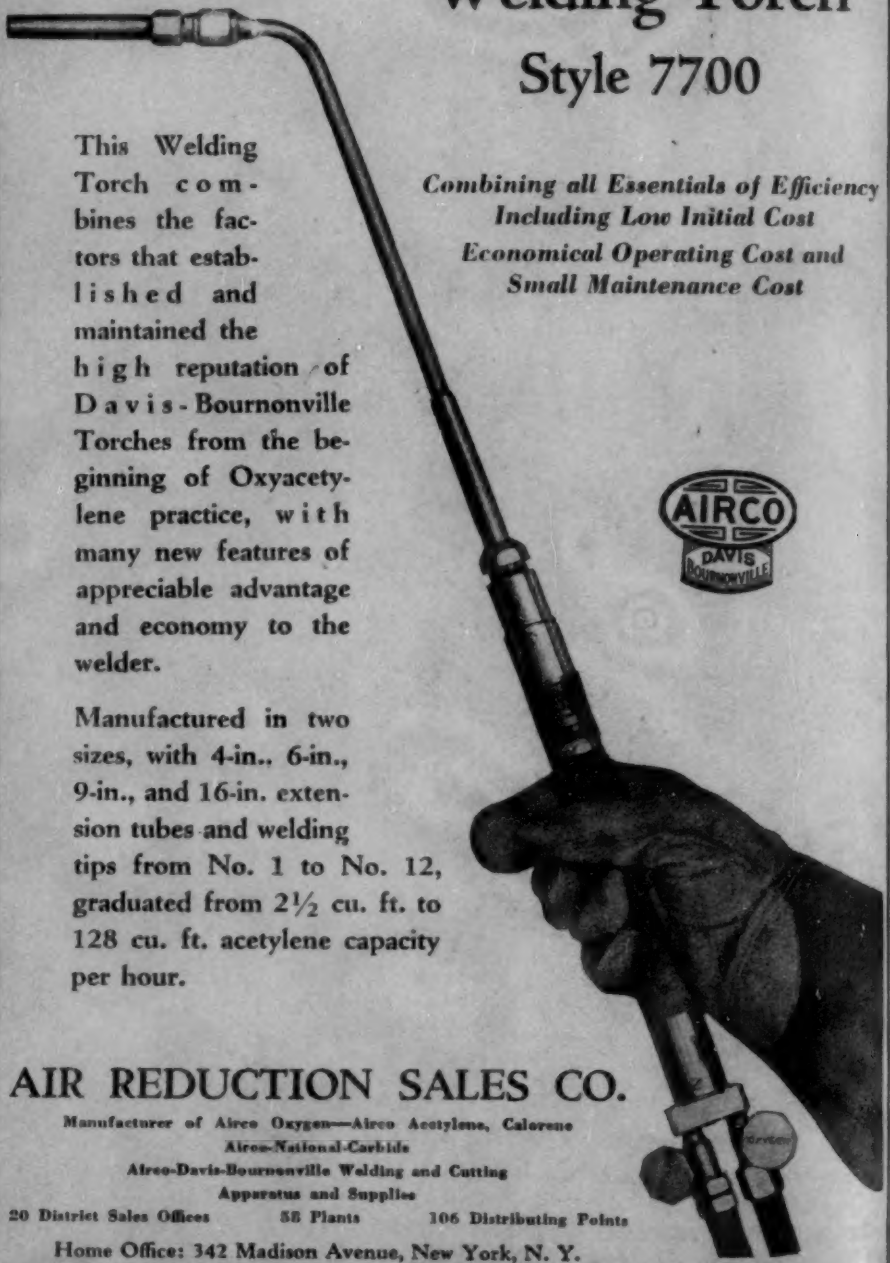
PAGE-ARMCO PROCESSED

Welding Wire *and* Electrodes

An Airco-Davis-Bournonville

Welding Torch

Style 7700



Combining all Essentials of Efficiency
Including Low Initial Cost
Economical Operating Cost and
Small Maintenance Cost

This Welding Torch combines the factors that established and maintained the high reputation of Davis-Bournonville Torches from the beginning of Oxyacetylene practice, with many new features of appreciable advantage and economy to the welder.

Manufactured in two sizes, with 4-in., 6-in., 9-in., and 16-in. extension tubes and welding tips from No. 1 to No. 12, graduated from 2½ cu. ft. to 128 cu. ft. acetylene capacity per hour.

AIR REDUCTION SALES CO.

Manufacturer of Airco Oxygen—Airco Acetylene, Calorene
Airco-National-Carbide
Airco-Davis-Bournonville Welding and Cutting
Apparatus and Supplies

20 District Sales Offices 58 Plants 106 Distributing Points

Home Office: 342 Madison Avenue, New York, N. Y.